



UNIT/PROGRAM NAME: Environmental Science
OFFICE OF PRIMARY RESPONSIBILITY: Department of Physical Sciences
ASSESSMENT COORDINATOR: Daniel Pardieck
SUBMISSION DATE OF THE REPORT: Monday, October 01, 2018

ACADEMIC YEAR 2017-2018

INSTRUCTIONS:

To comply with institutional effectiveness expectations, units/programs **MUST**:

- identify expected outcomes,
- assesses the extent to which it achieves these outcomes, and
- provide evidence of improvement based on analysis of the results

Guidance for preparing Unit Goals and Indicators of Success Reports:

- Use multiple assessments (Indicators of Success) for each Unit Goal.
- Reports must demonstrate engagement in on-going planning and assessment which is consistent over time to enable the unit to evaluate students, courses or a program. Shared widely within and across programs, the results of this assessment must be used to inform decisions about curricular and programmatic revisions. At appropriate intervals, program and learning outcomes and assessment methods should be evaluated and revised.
- Develop and/or use methods and instruments that are uniquely suited to the goal statements/Indicators of Success and that are supported by faculty/unit.
- Each Report must contain “mature data” (at least five years - sufficient information used as a basis for sound decision making).
- Each Report must provide evidence of improvement, based on the analysis of the assessment results, as opposed to a plan for improvement.

TABLE OF CONTENTS AND SUMMARY

(Edit document below this Table of Contents and then press Ctrl+8 to update the Table of Contents.)

- 1. **UNIT/PROGRAM GOAL 1:** Click here to enter Unit/Program Goal. i.e.: “To demonstrate the ability to...” 8
 - 1.1. **STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED:** Choose a Pillar..... 8
 - 1.2. **TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS:** Click here to enter Timeframe (Fall 2017, Academic Year 2017-2018, etc.) 8
 - 1.3. **INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES**..... 8
 - 1.4. **AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS:** Click here to add an average score (i.e.: Outcome 1 Score = 3 + Outcome Score 2 = 1 + Outcome 3 Score = 1 + Outcome 4 Score = 2 + Outcome 5 Score = 3. Total of Outcome Scores 1 – 5 = 10 ÷ 5 Total Outcomes = 2.00.) 9
 - 1.5. **ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:** 9
 - 1.6. **REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed:** Click here to enter a review date. 9
 - 1.6.1.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1:** Click here to enter dollar amount/other resources required. 10
 - 1.6.1.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results..... 10
 - 1.6.2.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2:** Click here to enter dollar amount/other resources required. 10
 - 1.6.2.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results..... 10
 - 1.6.3.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3:** Click here to enter dollar amount/other resources required. 10
 - 1.6.3.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results..... 11
 - 1.6.4.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4:** Click here to enter dollar amount/other resources required. 11
 - 1.6.4.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results..... 11
 - 1.6.5.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5:** Click here to enter dollar amount/other resources required. 12

1.6.5.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	12
1.7.	SUMMARY COMMENTS FOR OUTCOMES 1-5:	12
1.8.	CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: Click here to list the changes made/proposed to the program as a result of an analysis of the assessment results. Please be concise yet thorough.....	12
2.	UNIT/PROGRAM GOAL 2: Click here to enter Unit/Program Goal. i.e.: “To demonstrate the ability to...”	13
2.1.	STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: Choose a Pillar.....	13
2.2.	TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Click here to enter Timeframe (Fall 2017, Academic Year 2017-2018, etc.).....	13
2.3.	INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES	13
2.4.	AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: Click here to add an average score (i.e.: Outcome 1 Score = 3 + Outcome Score 2 = 1 + Outcome 3 Score = 1 + Outcome 4 Score = 2 + Outcome 5 Score = 3. Total of Outcome Scores 1 – 5 = 10 ÷ 5 Total Outcomes = 2.00.).....	14
2.5.	ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:	14
2.6.	REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: Click here to enter a review date.	15
2.6.1.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1: Click here to enter dollar amount/other resources required.....	15
2.6.1.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	15
2.6.2.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2: Click here to enter dollar amount/other resources required.....	16
2.6.2.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	16
2.6.3.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3: Click here to enter dollar amount/other resources required.....	16
2.6.3.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	16
2.6.4.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4: Click here to enter dollar amount/other resources required.....	16
2.6.4.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	16
2.6.5.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5: Click here to enter dollar amount/other resources required.....	16

2.6.5.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	17
2.7.	SUMMARY COMMENTS FOR OUTCOMES 1-5:	17
2.8.	CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: Click here to list the changes made/proposed to the program as a result of an analysis of the assessment results. Please be concise yet thorough.....	17
3.	UNIT/PROGRAM GOAL 3: Click here to enter Unit/Program Goal. i.e.: “To demonstrate the ability to...”	18
3.1.	STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: Choose a Pillar.....	18
3.2.	TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Click here to enter Timeframe (Fall 2017, Academic Year 2017-2018, etc.).....	18
3.3.	INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES	18
3.4.	AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: Click here to add an average score (i.e.: Outcome 1 Score = 3 + Outcome Score 2 = 1 + Outcome 3 Score = 1 + Outcome 4 Score = 2 + Outcome 5 Score = 3. Total of Outcome Scores 1 – 5 = 10 ÷ 5 Total Outcomes = 2.00.).....	19
3.5.	ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:	19
3.6.	REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: Click here to enter a review date.	20
3.6.1.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1: Click here to enter dollar amount/other resources required.....	20
3.6.1.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	20
3.6.2.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2: Click here to enter dollar amount/other resources required.....	20
3.6.2.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	20
3.6.3.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3: Click here to enter dollar amount/other resources required.....	20
3.6.3.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	21
3.6.4.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4: Click here to enter dollar amount/other resources required.....	21
3.6.4.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	21
3.6.5.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5: Click here to enter dollar amount/other resources required.....	21

3.6.5.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	21
3.7.	SUMMARY COMMENTS FOR OUTCOMES 1-5:	21
3.8.	CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: Click here to list the changes made/proposed to the program as a result of an analysis of the assessment results. Please be concise yet thorough.....	21
4.	UNIT/PROGRAM GOAL 4: Click here to enter Unit/Program Goal. i.e.: “To demonstrate the ability to...”	22
4.1.	STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: Choose a Pillar.....	22
4.2.	TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Click here to enter Timeframe (Fall 2017, Academic Year 2017-2018, etc.).....	22
4.3.	INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES	22
4.4.	AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: Click here to add an average score (i.e.: Outcome 1 Score = 3 + Outcome Score 2 = 1 + Outcome 3 Score = 1 + Outcome 4 Score = 2 + Outcome 5 Score = 3. Total of Outcome Scores 1 – 5 = 10 ÷ 5 Total Outcomes = 2.00.).....	24
4.5.	ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:	24
4.6.	REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: Click here to enter a review date.	24
4.6.1.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1: Click here to enter dollar amount/other resources required.....	25
4.6.1.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	25
4.6.2.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2: Click here to enter dollar amount/other resources required.....	25
4.6.2.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	25
4.6.3.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3: Click here to enter dollar amount/other resources required.....	25
4.6.3.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	25
4.6.4.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4: Click here to enter dollar amount/other resources required.....	25
4.6.4.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	26
4.6.5.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5: Click here to enter dollar amount/other resources required.....	26

4.6.5.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	26
4.7.	SUMMARY COMMENTS FOR OUTCOMES 1-5:	26
4.8.	CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: Click here to list the changes made/proposed to the program as a result of an analysis of the assessment results. Please be concise yet thorough.....	26
5.	UNIT/PROGRAM GOAL 5: Click here to enter Unit/Program Goal. i.e.: “To demonstrate the ability to...”	27
5.1.	STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: Choose a Pillar.....	27
5.2.	TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Click here to enter Timeframe (Fall 2017, Academic Year 2017-2018, etc.).....	27
5.3.	INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES	27
5.4.	AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: Click here to add an average score (i.e.: Outcome 1 Score = 3 + Outcome Score 2 = 1 + Outcome 3 Score = 1 + Outcome 4 Score = 2 + Outcome 5 Score = 3. Total of Outcome Scores 1 – 5 = 10 ÷ 5 Total Outcomes = 2.00.).....	28
5.5.	ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:	28
5.6.	REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: Click here to enter a review date.	29
5.6.1.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1: Click here to enter dollar amount/other resources required.....	29
5.6.1.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	29
5.6.2.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2: Click here to enter dollar amount/other resources required.....	29
5.6.2.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	30
5.6.3.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3: Click here to enter dollar amount/other resources required.....	30
5.6.3.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	30
5.6.4.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4: Click here to enter dollar amount/other resources required.....	30
5.6.4.2.	EXPLANATION OF HOW RESOURCES WILL BE USED: Click here to enter explanation of how the resources will be used to achieve or sustain results.....	30
5.6.5.1.	ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5: Click here to enter dollar amount/other resources required.....	30

5.6.5.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results..... 30

5.7. **SUMMARY COMMENTS FOR OUTCOMES 1-5:** 31

5.8. **CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5:** Click here to list the changes made/proposed to the program as a result of an analysis of the assessment results. Please be concise yet thorough..... 31

1. UNIT/PROGRAM GOAL 1: Students will demonstrate an understanding of the scientific basis (chemistry, biology, geology, basic environmental sciences) for environmental challenges and proposed solutions.

1.1. STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: 4. Graduates Who Are Gainfully Employed or Admitted to Graduate School

1.2. TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Academic Year 2017-2018

1.3. INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES¹

Indicator of Success / Student Learning Outcome	Summary Data for this Timeframe	Expected Outcome: Met (3)	Expected Outcome: Partially Met (2)	Expected Outcome: Not Met (1)	Score
1.3.1. 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.	Ave. = 2.46 N=27	The mean of all student scores are at or above 2.0	The mean of all student scores are above 1.7 and less than 2.0	The mean of all student scores are less than or equal to 1.7	3.00
1.3.2. The mean scores on specific questions related to chemistry content knowledge on a locally designed environmental science exit exam.	27.3% N=3	The mean score of all student scores are greater than 50% on specific questions related to chemistry.	The mean score of all student scores are greater than 35% and less than 50% on specific questions related to chemistry.	The mean score of all student scores are less than or The mean score of all student scores are less than or equal to 35% on specific questions related to chemistry.	1.00
1.3.3. The mean scores on specific questions related to biology content knowledge on a locally designed environmental science exit exam.	52.8% N=3	The mean score of all student scores are greater than 50% on specific questions related to biology.	The mean score of all student scores are greater than 35% and less than 50% on specific questions related to biology.	The mean score of all student scores are less than or equal to 35% on specific questions related to biology.	3.00
1.3.4. The mean scores on specific questions related to geology content knowledge on a locally designed environmental science exit exam.	40.2% N=3	The mean score of all student scores are greater than 50% on specific questions related to geology.	The mean score of all student scores are greater than 35% and less than 50% on specific questions related to geology.	The mean score of all student scores are less than or equal to 35% on specific questions related to geology.	2.00

¹ Expected Outcomes **must** be mutually exclusive for Met, Partially Met and Not Met.

1.3.5. The mean scores on specific questions related to environmental science content knowledge on a locally designed environmental science exit exam.	56.1% N=3	The mean score of all student scores are greater than 50% on specific questions related to basic environmental sciences	The mean score of all student scores are greater than 35% and less than 50% on specific questions related to environmental sciences	The mean score of all student scores are less than or equal to 35% on specific questions related to environmental sciences.	3.00
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1.4. AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: 2.4

1.5. ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:

Indicator of Success	Assessment Instruments	Frequency of Assessment
1.5.1.	Presentation, Poster and/or Research Paper Rubric	Annually - used to evaluate student research paper, semester project or presentation from ES-301/302, 310, 407, 490, GEOL 405 or PSCI 499). ES 301/302, ES 310 and GEOL 405 are each taught every other year, while PSCI 499 is taught every spring term and ES 407 (environmental research) and ES 490 (environmental internship) are offered on demand.
1.5.2.	A locally designed environmental science exit exam	Annually - administered to students in PSCI 499
1.5.3.	A locally designed environmental science exit exam	Annually - administered to students in PSCI 499
1.5.4.	A locally designed environmental science exit exam	Annually - administered to students in PSCI 499
1.5.5.	A locally designed environmental science exit exam	Annually - administered to students in PSCI 499

1.6. REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: 9/6/2018

(THE FOCUS OF NARRATIVE SHOULD BE ON PROVIDING EVIDENCE OF IMPROVEMENT, BASED ON THE ANALYSIS OF THE ASSESSMENT RESULTS, AND NOT A PLAN FOR IMPROVEMENT):

1.6.1. **OUTCOME 1 COMMENTS:** The objective was met for this assessment instrument. Therefore, no improvement is required based on this result. This year, the assessment was based on Rubrics for ES 405, ES 310 and ES 490. Both paper and presentation rubrics were included.

- 1.6.1.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1:** No additional resources are sought on the basis of this assessment instrument result.
- 1.6.1.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** N.A.
- 1.6.2. **OUTCOME 2 COMMENTS:** The objective was not met according to this assessment instrument. This outcome refers specifically to knowledge regarding the chemistry component of the ES program. The exit exam was completed by a numerically insignificant number of individuals (3). Nevertheless, a review of the results of individual questions was conducted to identify any potential issues with the program. Of the questions missed by all three students, two questions were missed in what may have been included in the Analytical Chemistry (CHEM 330) content (Basic understanding of emission spectography, titration with EDTA). All three organic chemical structure questions were missed (CHEM 220). One BIOL 306 related question (usable forms of nitrogen for plants), one CHEM 420 related question (speciation of N, S and Mn compounds in lake bottom), possibly also BIOL 415 related, was missed. A question related to identity of mineral products of weathering (GEOL 111 and ES 310) was also missed. Environmental Chemistry (CHEM 420) is a major elective, and not all ES students take it. Beginning with the 2018-2019 catalog, ES 420 will be a required core course for the curriculum. This should address that area of challenge. With this requirement for ES 420 in the core, it is expected that students graduating from the program will improve in strength in the discipline of chemistry. These improvements should become noticed in the next three years as the new cohort of students works through the curriculum and takes the exit exam. Further, with this requirement, a suitable assessment instrument from that course (ES 420) will be identified and implemented in the future. The questions related to CHEM 330 and CHEM 220 will be reviewed with the instructors of those courses to determine their continued relevance. If not, other questions for the exit exam will be substituted and/or added.
- 1.6.2.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2:** It is not currently anticipated that additional resources would be needed to address this learning outcome. The new core requirement to be implemented catalog year 2018-2019, CHEM 420, is currently offered every spring term. It would continue to be offered every spring term. There is capacity for several more students in this course as currently taught, so no additional sections would be needed. The other change involves meeting with other faculty, so no resources are needed there.
- 1.6.2.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA
- 1.6.3. **OUTCOME 3 COMMENTS:** The outcome was met according to this assessment instrument. No changes are anticipated according to this result. It is relatively normal for ES students to do quite well on the Biology component of the curriculum, and this year was no exception.
- 1.6.3.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3:** No additional resources are required based on the results of this outcome assessment.

1.6.3.2. **EXPLANATION OF HOW RESOURCES WILL BE USED: NA**

1.6.4. **OUTCOME 4 COMMENTS:** The outcome was partially met according to this assessment instrument, which refers specifically to the geology component of the ES curriculum (GEOL 111 or PSCI 112, ES 310, GEOL 405). An insignificant number of students completed the exit exam this year. Yet, to identify areas of potential challenge for the ES program curriculum, a review of the individual, geology-related questions on the exit exam was conducted. Of the 29 geology-related multiple choice questions on the exam, 7 were answered incorrectly by all three students. Of these, questions 22 and 74 were both included in the chemistry-related questions that were answered incorrectly by all three students. The requirement for CHEM 420, beginning with academic year 2018-2019, is expected to address that issue going forward. One question missed by all three students (number 42), regarding the Theiss Equation, is covered relatively late in the spring term in GEOL 405 (hydrogeology). All three students were enrolled in the course at that time, and this question dealt with material that was discussed after the date the exit exam was given. So, for that reason, the result is not unexpected and does not really identify a challenge for the curriculum. All other hydrogeology related questions were answered correctly by at least one student. GEOL 405 is offered every other spring term. Three of the questions missed by all three students (35, 52 and 74) are parts of GEOL 111 (taken freshman year and/or ES 310 (Environmental Geology). All three students were in ES 310 the previous fall term. They should have been able to answer the question on the Unified Soil Classification System, which is covered in detail. An assignment on the system will be added going forward, which should additionally reinforce that material. Understanding of the Unified Soil Classification System is particularly useful for many students who will serve as environmental professionals in the future. The other two questions refer to volcanoes and igneous processes. These are detailed in GEOL 111 and in ES 310, though this topic is of lower priority in ES 310. No changes are anticipated regarding volcanoes or igneous processes at this time. The final question missed by all three students (34), refers to fault types (Structural Geology). This material is discussed in GEOL 111 and ES 310. It has not been uncommon for students to miss this question or other structural geology questions in the exit exam in previous assessment cycles. In future, the instructor will add the appropriate structure diagrams and assign a problem with a structural geology problem to ES 310, beginning Fall 2018. The priority regarding fault geology in ES 310 has been on an understanding of the earthquake cycle and what happens within a fault zone, rather than a review of fault structure nomenclature. The nomenclature will be included and reinforced by way of introduction of this topic in the course. A review of this material in that course is helpful for students who will be doing work in environmental geology or interpreting geologic maps, a fundamental skill for many environmental workers.

1.6.4.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4:** No major new resources are anticipated or required to make the changes indicated above. No additional resources are anticipated at this time.

1.6.4.2. **EXPLANATION OF HOW RESOURCES WILL BE USED: NA**

1.6.5. **OUTCOME 5 COMMENTS:** The goal for this learning outcome has been met according to the assessment instrument. It is normal for students to do quite well on this outcome measure, which is covered in ES 301, ES 302, and ES 310. Key points, such as those covered in the 38 questions in the

exit exam that deal with general environmental science, are reinforced several times in the ES curriculum. No change to curriculum or assessment is indicated by the results of the assessment of this learning outcome.

1.6.5.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5:** None are indicated for this learning outcome.

1.6.5.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

1.7. SUMMARY COMMENTS FOR OUTCOMES 1-5:

The mean value for outcomes 1-5 is 2.48. Three outcomes were met, one was partially met (related to geology-related knowledge) and one was not met (related to chemistry-related knowledge).

1.8. **CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5:** For the partially met outcome, changes to the structural geology and soil classification components of the ES 310 (Environmental Geology) content will be made to reinforce the major points missed by the three students, all of whom took ES 310 in Fall 2017. In addition, visuals and an assignment will be added to the course to reinforce the subject matter in question. The not met outcome of chemistry related knowledge will be addressed by implementation of a core requirement for CHEM 420, Environmental Chemistry. For the chemistry-related material covered by CHEM 330 (Analytical Chemistry) and CHEM 220 (Organic Chemistry), the assessment coordinator will meet with the instructors of those courses to ensure that the questions are still relevant and, if a change is indicated, the assessment instrument will be modified (questions substituted or added). No additional resources are anticipated or proposed at this time.

2. UNIT/PROGRAM GOAL 2: 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

2.1. STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: 4. Graduates Who Are Gainfully Employed or Admitted to Graduate School

2.2. TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Academic Year 2017-2018

2.3. INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES²

Indicator of Success / Student Learning Outcome	Summary Data for this Timeframe	Expected Outcome: Met (3)	Expected Outcome: Partially Met (2)	Expected Outcome: Not Met (1)	Score
2.3.1 Mean scores of the portions of a presentation or poster rubric that ask reviewers to assess critical thinking skills and use of the scientific method in semester assignments in ES-301/302, 310, 407, 490, GEOL 405 or PSCI 499	2.4 N=14	The mean of all student scores are at or above 2.0	The mean of all student scores are above 1.7 and less than 2.0	The mean of all student scores will be less than 1.7	3.00
2.3.2 The mean scores on specific questions requiring students to demonstrate critical thinking and/or the use of the scientific method on a locally written environmental science exit exam.	59% N=3	The mean score of all student scores are greater than 50% on specific questions related to this Indicator of Success	The mean score of all student scores are greater than 35% and less than 50% on specific questions related to this Indicator of Success	The mean score of all student scores are less than 35% on specific questions related to this Indicator of Success	3.00
2.3.3 Outcome 3: click here to enter Indicator of Success/Student Learning Outcome 3.	Click here to enter Outcome 3 Summary Data.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which "Meets" the expectations of the unit/program.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which "Partially Meets" the	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which "Does Not Meet" the expectations of the unit/program.	Outcome 3: Score.

² Expected Outcomes **must** be mutually exclusive for Met, Partially Met and Not Met.

			expectations of the unit/program.		
2.3.4. Outcome 4: click here to enter Indicator of Success/Student Learning Outcome 4.	Click here to enter Outcome 4 Summary Data.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which "Meets" the expectations of the unit/program.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which "Partially Meets" the expectations of the unit/program.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which "Does Not Meet" the expectations of the unit/program.	Outcome 4: Score.
2.3.5. Outcome 5: click here to enter Indicator of Success/Student Learning Outcome 5.	Click here to enter Outcome 5 Summary Data.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which "Meets" the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which "Partially Meets" the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which "Does Not Meet" the expectations of the unit/program.	Outcome 5: Score.

2.4. AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: 3.00

2.5. ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:

Indicator of Success	Assessment Instruments	Frequency of Assessment
2.5.1.	Research Paper, Presentation or Poster Rubric	Annually - used to evaluate student research paper, semester project or presentation from ES-301/302, 310, 407, 490, GEOL 405 or PSCI 499). ES 301/302, ES 310 and

		GEOL 405 are each taught every other year, while PSCI 499 is taught every spring term and ES 407 (environmental research) and ES 490 (environmental internship) are offered on demand.
2.5.2.	A locally designed environmental science exit exam	Annually - administered to students in PSCI-499
2.5.3.	Outcome 3: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 3.	Outcome 3: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 3.
2.5.4.	Outcome 4: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 4.	Outcome 4: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 4.
2.5.5.	Outcome 5: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 5.	Outcome 5: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 5.

2.6. REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: 9/19/2018

(THE FOCUS OF NARRATIVE SHOULD BE ON PROVIDING EVIDENCE OF IMPROVEMENT, BASED ON THE ANALYSIS OF THE ASSESSMENT RESULTS, AND NOT A PLAN FOR IMPROVEMENT):

2.6.1. **OUTCOME 1 COMMENTS:** This goal was met for both outcomes selected for its assessment. No modifications or improvements of the program or assessment instrument are indicated by these results. Nevertheless, additional outcomes will be considered for assessment of this goal to provide a more robust analysis in future. It should be noted that, starting in 2016-2017, students in ES 301/ES 302 are strongly encouraged to participate in the annual spring term Academic Symposium by preparing and presenting posters on the course research projects. In Spring 2017, all students participated by presenting posters. This provides additional opportunity for students to address thos goal by preparing to answer questions that may be asked by judges or visitors of the symposium.

2.6.1.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1:** No additional resources are required at this time to sustain or improve this learning outcome.

2.6.1.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

2.6.2. **OUTCOME 2 COMMENTS:** This goal was met for both outcomes selected for its assessment. No modifications or improvements of the program or assessment instrument are indicated by these results. Nevertheless, additional outcomes will be considered for assessment of this goal to provide a

more robust analysis in future. It should be noted that, starting in 2016-2017, students in ES 301/ES 302 are strongly encouraged to participate in the annual spring term Academic Symposium by preparing and presenting posters on the course research projects. In Spring 2017, all students participated by presenting posters. This provides additional opportunity for students to address this goal by preparing to answer questions that may be asked by judges or visitors of the symposium.

2.6.2.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2:** No additional resources are required at this time to sustain or improve this learning outcome.

2.6.2.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

2.6.3. **OUTCOME 3 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

2.6.3.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3:** Click here to enter dollar amount/other resources required.

2.6.3.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

2.6.4. **OUTCOME 4 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

2.6.4.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4:** Click here to enter dollar amount/other resources required.

2.6.4.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

2.6.5. **OUTCOME 5 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

2.6.5.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5:** Click here to enter dollar amount/other resources required.

2.6.5.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

2.7. SUMMARY COMMENTS FOR OUTCOMES 1-5:

This goal was met for both outcomes selected for its assessment. No modifications or improvements of the program or assessment instrument are indicated by these results. Nevertheless, additional outcomes will be considered for assessment of this goal in order to provide a more robust analysis in future. It should be noted that, starting in 2016-2017, students in ES 301/ES 302 are strongly encouraged to participate in the annual spring term Academic Symposium by preparing and presenting posters on the course research projects. In Spring 2017, all students participated by presenting posters. This provides additional opportunity for students to address this goal by preparing to answer questions that may be asked by judges or visitors of the symposium. This practice will continue with the 2018-2019 academic year. ES 301/ES 302 are offered every other academic year.

2.8. CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: No proposed changes will be made to the program predicated on results of assessment for this goal at this time. Students will continue to be strongly encouraged to participate in the Academic Symposium at Lander by presenting their project work for ES 301/ES302 and ES 407.

3. UNIT/PROGRAM GOAL 3: Students will demonstrate the development of writing and presentation skills appropriate for students and practitioners in the discipline of environmental science.

3.1. STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: 4. Graduates Who Are Gainfully Employed or Admitted to Graduate School

3.2. TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Academic Year 2017-2018

3.3. INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES³

Indicator of Success / Student Learning Outcome	Summary Data for this Timeframe	Expected Outcome: Met (3)	Expected Outcome: Partially Met (2)	Expected Outcome: Not Met (1)	Score
3.3.1 Mean scores on questions related to the demonstration of writing or presentation skills on assignment rubrics for term papers or semester projects from ES-301/302, 310, 407, 490 or GEOL405	2.42 N=21	The mean of all student scores are at or above 2.0	The mean of all student scores are above 1.7 and less than 2.0	The mean of all student scores are less than or equal to 1.7	3.00
3.3.2 Mean scores on questions related to the demonstration of writing or presentation skills on poster rubrics in ES 407.	NA (no posters were completed for these items.)	The mean of all student scores are at or above 2.0	The mean of all student scores are above 1.7 and less than 2.0	The mean of all student scores are less than or equal to 1.7	Outcome 2: Score.
3.3.3 Mean scores on questions related to the demonstration of writing or presentation skills on presentation rubrics in PSCI 499	1.89 N=2	The mean of all student scores are at or above 2.0	The mean of all student scores are above 1.7 and less than 2.0	The mean of all student scores are less than or equal to 1.7	2.00
3.3.4 Mean scores on specific questions related to communication skills on mock interview rubrics in PSCI 499	86% N=3	The mean score of all student scores at or above 80%. Prior to 2015, the mean of all student scores are at or above 2.0	The mean score of all student scores between 70% and 84%. Prior to 2015, the mean of all student scores are above 1.7 and less than 2.0	The mean score of all student scores below 70%. Prior to 2015, the mean of all student scores are less than or equal to 1.7	3.00

³ Expected Outcomes **must** be mutually exclusive for Met, Partially Met and Not Met.

3.3.5. Outcome 5: click here to enter Indicator of Success/Student Learning Outcome 5.	Click here to enter Outcome 5 Summary Data.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which “Meets” the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which “Partially Meets” the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which “Does Not Meet” the expectations of the unit/program.	Outcome 5: Score.
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3.4. AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: 2.7

3.5. ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:

Indicator of Success	Assessment Instruments	Frequency of Assessment
3.5.1.	Research Paper or Presentation Rubric	Annually - used to evaluate student research paper, semester project or presentation from ES-301/302, 310, or GEOL 405). ES 301/302, ES 310 and GEOL 405 are each taught every other year. , while PSCI 499 is taught every spring term and ES 407 (environmental research) and ES 490 (environmental internship) are offered on demand.
3.5.2.	Poster Presentation Rubric	Determined when the course is given. ES 407 and ES 490 are available on demand.
3.5.3.	Presentation Rubric	Annually – administered to students in PSCI 499
3.5.4.	Mock Interview Rubric	Annually – administered to students in PSCI 499
3.5.5.	Outcome 5: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 5.	Outcome 5: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 5.

3.6. REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: 9/20/2018

(THE FOCUS OF NARRATIVE SHOULD BE ON PROVIDING EVIDENCE OF IMPROVEMENT, BASED ON THE ANALYSIS OF THE ASSESSMENT RESULTS, AND NOT A PLAN FOR IMPROVEMENT):

3.6.1. **OUTCOME 1 COMMENTS:** The goal was met according to this assessment instrument or outcome. No changes to the program are indicated by this result.

3.6.1.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1:** No additional resources are required to maintain the results or make improvements according to the scores on this student outcome.

3.6.1.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

3.6.2. **OUTCOME 2 COMMENTS:** This student outcome was not assessed during this assessment period. No students completed a poster during this assessment period in ES 407 or ES 490. The courses are available on demand.

3.6.2.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2:** NA

3.6.2.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

3.6.3. **OUTCOME 3 COMMENTS:** The goal was partially met for this outcome, or assessment instrument. Only two individual scores are included, which does not indicate a statistically valid sample. The outcome relates to presentations given by students in PSCI 499, the annual capstone course for the Department of Physical Sciences. This result is somewhat unexpected, because ES students would have made a minimum of four presentations of semester research projects in four courses, if not more, and instruction on making quality presentations was often provided. But, this result seems to indicate that a renewed, even expanded, effort in developing skills in making verbal presentations is indicated. This will be provided in ES 301/ES 302 lab, with a stronger encouragement or even mandatory requirement for students to partake of presentation workshops. In the last two academic years, the Chemistry Program has added one-hour seminar courses in developing general research, writing and presentation skills to their majors. The ES program has opted to continue developing these skills in the context of other courses rather than to participate in these seminar courses. The addition of the seminars to the Chemistry Program may have changed some of the content of PSCI 499, in which, in the past, instruction was included on making quality professional presentations.

3.6.3.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3:** No additional resources are indicated at this time. Proposed changes can be made without additional resources.

3.6.3.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

3.6.4. **OUTCOME 4 COMMENTS:** The goal was met according to this outcome, or assessment instrument. The assessment instrument was a rubric completed during mock interviews given as part of the requirements for PSCI 499, each Spring term. The students did quite well in this activity, so no improvements to the program are indicated by this result.

3.6.4.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4:** No additional resources are indicated by the result of assessment of this outcome, or assessment instrument.

3.6.4.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

3.6.5. **OUTCOME 5 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

3.6.5.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5:** Click here to enter dollar amount/other resources required.

3.6.5.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

3.7. SUMMARY COMMENTS FOR OUTCOMES 1-5:

This goal has been largely met for the assessed outcomes, or instruments. The one area of softness was in the PSCI 499 project presentations summarized as outcome 3, where the goal was 'partially met'. There were only two students assessed for outcome 3 during the current assessment period. Of these two, one student did not meet the goal, while the other did. Results based on a single student would not normally rationalize significant change in the program. Instead, a minor change, in which additional course embedded instruction and opportunity to participate in workshops to enhance presentation skills will be done in ES 301/ES 302. Further, students in ES 301/ES 302 and ES 407 are strongly encouraged to present their work in the annual Academic Symposium at Lander University, which occurs during each Spring term.

3.8. CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: A minor change, in which additional course embedded instruction and opportunity to participate in workshops to enhance presentation skills will be done in ES 301/ES 302. Instruction will also be provided in ES 310 and ES 405, as students prepare for semester project presentations. These have been inconsistently applied over the last few years, but will be increased in priority for instructional time and outside class meetings moving forward.

4. UNIT/PROGRAM GOAL 4: Students will demonstrate 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 policies, problems and decisions.

4.1. STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED: 4. Graduates Who Are Gainfully Employed or Admitted to Graduate School

4.2. TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS: Academic Year 2017-2018

4.3. INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES⁴

Indicator of Success / Student Learning Outcome	Summary Data for this Timeframe	Expected Outcome: Met (3)	Expected Outcome: Partially Met (2)	Expected Outcome: Not Met (1)	Score
<p>4.3.1 Current (starting Spring 2014): 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 policies, problems and decisions.</p> <p>Former (prior to Spring 2014): Mean scores on questions related to this goal on mock interview rubrics in PSCI 499.</p>	59% N=3	<p>2014 and later: The mean score of all student scores are greater than 50% on specific questions related to this Indicator of Success.</p> <p>Prior to 2014: The mean of all student scores are at or above 2.0</p>	<p>2014 and later: The mean score of all student scores are greater than 35% and less than 50% on specific questions related to this Indicator of Success</p> <p>Prior to 2014: The mean of all student scores are above 1.7 and less than 2.0</p>	<p>2014 and later: The mean score of all student scores are less than 35% on specific questions related to this Indicator of Success</p> <p>Prior to 2014: The mean of all student scores are less or equal to 1.7</p>	3.00
4.3.2 Outcome 2: click here to enter Indicator of Success/Student Learning Outcome 2.	Click here to enter Outcome 2 Summary Data.	Outcome 2: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 2 (i.e.: a score, a range of scores) describing a level of attainment which	Outcome 2: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 2 (i.e.: a score, a range of scores) describing a level of attainment which	Outcome 2: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 2 (i.e.: a score, a range of scores) describing a level of attainment which "Does	Outcome 2: Score.

⁴ Expected Outcomes **must** be mutually exclusive for Met, Partially Met and Not Met.

		“Partially Meets” the expectations of the unit/program.	“Partially Meets” the expectations of the unit/program.	Not Meet” the expectations of the unit/program.	
4.3.3 Outcome 3: click here to enter Indicator of Success/Student Learning Outcome 3.	Click here to enter Outcome 3 Summary Data.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which “Meets” the expectations of the unit/program.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which “Partially Meets” the expectations of the unit/program.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which “Does Not Meet” the expectations of the unit/program.	Outcome 3: Score.
4.3.4 Outcome 4: click here to enter Indicator of Success/Student Learning Outcome 4.	Click here to enter Outcome 4 Summary Data.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which “Meets” the expectations of the unit/program.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which “Partially Meets” the expectations of the unit/program.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which “Does Not Meet” the expectations of the unit/program.	Outcome 4: Score.
4.3.5 Outcome 5: click here to enter Indicator of Success/Student Learning Outcome 5.	Click here to enter Outcome 5 Summary Data.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which “Meets” the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which “Partially Meets” the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which “Does Not Meet” the expectations of the unit/program.	Outcome 5: Score.

expectations of the unit/program.

4.4. AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: 3.00

4.5. ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:

Indicator of Success

Assessment Instruments

Frequency of Assessment

4.5.1.	Since 2014: Selected essay and multiple choice questions on a locally produced exit exam. Prior to 2014, Mock Interview Rubric	Annually - used to evaluate students in PSCI-499.
4.5.2.	Outcome 2: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 2.	Outcome 2: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 2.
4.5.3.	Outcome 3: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 3.	Outcome 3: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 3.
4.5.4.	Outcome 4: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 4.	Outcome 4: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 4.
4.5.5.	Outcome 5: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 5.	Outcome 5: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 5.

4.6. REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: 9/20/2018

(THE FOCUS OF NARRATIVE SHOULD BE ON PROVIDING EVIDENCE OF IMPROVEMENT, BASED ON THE ANALYSIS OF THE ASSESSMENT RESULTS, AND NOT A PLAN FOR IMPROVEMENT):

- 4.6.1. **OUTCOME 1 COMMENTS:** The goal was met according to this outcome, or assessment instrument. The assessment instrument consists of a series of essay questions on a locally created exit exam given to ES majors in PSCI 499 every Spring term. These questions require that students complete an analysis and synthesis of an environmental challenge they select from a list, and project the role of environmental science in the world

going into the future. Successful completion requires an interdisciplinary perspective in which social, economic and political factors are considered, as well as science and engineering. All three (3) of the students who completed the exam this year met the goal according to this outcome.

4.6.1.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1:** No additional resources are indicated by this result for this goal.

4.6.1.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** NA

4.6.2. **OUTCOME 2 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

4.6.2.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2:** Click here to enter dollar amount/other resources required.

4.6.2.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

4.6.3. **OUTCOME 3 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

4.6.3.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3:** Click here to enter dollar amount/other resources required.

4.6.3.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

4.6.4. **OUTCOME 4 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

4.6.4.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4:** Click here to enter dollar amount/other resources required.

4.6.4.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

4.6.5. **OUTCOME 5 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.

4.6.5.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5:** Click here to enter dollar amount/other resources required.

4.6.5.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

4.7. **SUMMARY COMMENTS FOR OUTCOMES 1-5:**

The goal was met. However, data were collected for this goal for only this single outcome/assessment instrument. An objective for future assessment rounds would be to have at least one additional student learning outcome attached to this goal in order to increase confidence in assessment results.

4.8. **CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5:** At least one additional outcome is needed to adequately assess this goal. The use of a case study assignment in ES 302 (or ES 301 in future) will be considered. The assigned case studies will require integration of economic, social, political and ethical perspectives on a major environmental challenge. These will be developed and implemented in the academic year 2020-2021, the next time these courses are offered. In 2020-2021 and subsequent years, ES 301/ES 302 can be modified to expand a focus on integrated case studies because a new course, ES 111, will be added to the curriculum beginning in Spring 2019, which will remove some of the more basic content currently done in ES 301 to get all of the students to the same point. This should free some instructional time for developing case study skills. Integrative case studies and related skills of integration will be added to lab/recitation sessions associated with these two courses, as well.

5. UNIT/PROGRAM GOAL 5: To comply with Program Productivity standards as defined by the South Carolina Commission on Higher Education

5.1. **STRATEGIC PLANNING FRAMEWORK PILLAR SUPPORTED:** 1. High Demand, Market-Driven Programs

5.2. **TIMEFRAME FOR ASSESSMENT OF THIS GOAL AND INDICATORS OF SUCCESS:** Academic Year 2017-2018

5.3. **INDICATORS OF SUCCESS/STUDENT LEARNING OUTCOMES, SUMMARY OF OUTCOME DATA AND EXPECTED OUTCOMES⁵**

Indicator of Success / Student Learning Outcome	Summary Data for this Timeframe	Expected Outcome: Met (3)	Expected Outcome: Partially Met (2)	Expected Outcome: Not Met (1)	Score
5.3.1 Major Enrollment	14.2	Using a five-year rolling average, the number of students enrolled in the major (a) for Baccalaureate programs is greater than or equal to 12.5, (b) for Master's/First Professional is greater than or equal to 6.	Not Applicable	Using a five-year rolling average, the number of students enrolled in the major (a) for Baccalaureate programs is less than 12.5 (b) for Master's/First Professional is less than 6.	3.00
5.3.2 Completions (Degrees Awarded)	3.4	Using a five-year rolling average, the number of degrees awarded (a) for Baccalaureate programs is greater than or equal to 8, (b) for Master's/First Professional is greater than or equal to 3.	Not Applicable	Using a five-year rolling average, the number of degrees awarded (a) for Baccalaureate programs is less than 8 (b) for Master's/First Professional is less than 3.	1.00
5.3.3 Outcome 3: click here to enter Indicator of Success/Student Learning Outcome 3.	Click here to enter Outcome 3 Summary Data.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which "Meets" the expectations of the unit/program.	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which "Partially Meets" the	Outcome 3: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 3 (i.e.: a score, a range of scores) describing a level of attainment which "Does Not Meet" the expectations of the unit/program.	Outcome 3: Score.

⁵ Expected Outcomes **must** be mutually exclusive for Met, Partially Met and Not Met.

			expectations of the unit/program.		
5.3.4. Outcome 4: click here to enter Indicator of Success/Student Learning Outcome 4.	Click here to enter Outcome 4 Summary Data.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which "Meets" the expectations of the unit/program.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which "Partially Meets" the expectations of the unit/program.	Outcome 4: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 4 (i.e.: a score, a range of scores) describing a level of attainment which "Does Not Meet" the expectations of the unit/program.	Outcome 4: Score.
5.3.5. Outcome 5: click here to enter Indicator of Success/Student Learning Outcome 5.	Click here to enter Outcome 5 Summary Data.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which "Meets" the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which "Partially Meets" the expectations of the unit/program.	Outcome 5: click here to enter a specific and measurable outcome for Indicator of Success/Student Learning Outcome 5 (i.e.: a score, a range of scores) describing a level of attainment which "Does Not Meet" the expectations of the unit/program.	Outcome 5: Score.

5.4. AVERAGE SCORE FOR ALL INDICATORS OF SUCCESS: 2.0

5.5. ASSESSMENT INSTRUMENTS AND FREQUENCY OF ASSESSMENT:

**Indicator
of
Success**

Assessment Instruments

Frequency of Assessment

5.5.1.	South Carolina Commission on Higher Education Management Information System (CHEMIS), the Commission's Academic Degree Program Inventory, Lander University Fact Book	Annually
5.5.2.	South Carolina Commission on Higher Education Management Information System (CHEMIS), the Commission's Academic Degree Program Inventory, Lander University Fact Book	Annually
5.5.3.	Outcome 3: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 3.	Outcome 3: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 3.
5.5.4.	Outcome 4: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 4.	Outcome 4: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 4.
5.5.5.	Outcome 5: click here to enter the assessment instrument used for Indicator of Success/Student Learning Outcome 5.	Outcome 5: click here to enter the frequency of assessment for Indicator of Success/Student Learning Outcome 5.

5.6. REVIEW AND SUMMARY OF EXPECTED OUTCOMES – Date Reviewed: 9/20/2018

(THE FOCUS OF NARRATIVE SHOULD BE ON PROVIDING EVIDENCE OF IMPROVEMENT, BASED ON THE ANALYSIS OF THE ASSESSMENT RESULTS, AND NOT A PLAN FOR IMPROVEMENT):

5.6.1. **OUTCOME 1 COMMENTS:** The goal was met for this outcome, or assessment instrument. Nevertheless, this number has been declining in recent years, even though it remains significantly above the minimum requirements.

5.6.1.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 1:** \$3,000

5.6.1.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Resources will be used for recruiting efforts for the program, including attending college events, speaking to highschool audiences, mailings, and other contacts with prospective students. The addition of a new introductory course, ES 111, and outreach efforts by students in the Environmental Science Student Organization (ESSO) will also be of assistance in improving performance on this learning outcome.

5.6.2. **OUTCOME 2 COMMENTS:** This goal was not met for this outcome, or assessment instrument.

5.6.2.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 2:** \$3000 (the same \$3000 indicated for the previous outcome.)

- 5.6.2.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Resources will be used for recruiting efforts for the program, including attending college events, speaking to highschool audiences, mailings, and other contacts with prospective students. The addition of a new introductory course, ES 111, and outreach efforts by students in the Environmental Science Student Organization (ESSO) will also be of assistance in improving performance on this learning outcome.
- 5.6.3. **OUTCOME 3 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.
- 5.6.3.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 3:** Click here to enter dollar amount/other resources required.
- 5.6.3.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.
- 5.6.4. **OUTCOME 4 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.
- 5.6.4.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 4:** Click here to enter dollar amount/other resources required.
- 5.6.4.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.
- 5.6.5. **OUTCOME 5 COMMENTS:** Click here to enter a discussion of the assessment results and actions taken to improve the unit/program based on an analysis of assessment data.
- 5.6.5.1. **ADDITIONAL RESOURCES REQUIRED TO ACHIEVE OR SUSTAIN RESULTS FOR INDICATOR OF SUCCESS 5:** Click here to enter dollar amount/other resources required.
- 5.6.5.2. **EXPLANATION OF HOW RESOURCES WILL BE USED:** Click here to enter explanation of how the resources will be used to achieve or sustain results.

5.7. SUMMARY COMMENTS FOR OUTCOMES 1-5:

The goal was partially met. It was met for total enrollment requirements (>14 for a five-year rolling average) and not met for graduation requirements (>8 five-year rolling average). The numbers challenge for the ES program is rather difficult to understand, given that the employment prognosis for several careers for which this program prepares students is above average, according to the US Department of Labor; and the placement history for students graduating from Lander University's program has been excellent to good. It is typical for graduating students to have employment offers in hand before graduation. It is likely that the lack of awareness of careers in this field by high school students, counselors and teachers is a large part of this problem. The career paths available to graduates of this program lack prominence in the state's career cluster framework for secondary schools. Further, ES does not appear to be heavily marketed by the institution, possibly due to its lack of signature program status and its small size relative to other programs at this institution (the karst hypothesis for program support.) Another challenge has been the apparent confusion on the part of prospects and parents as to what the program does. Students often express an interest in 'helping the environment' without apparently knowing that the ES program at Lander is a rigorous, science based program focused on developing skills and knowledge to help solve environmental challenges. Some students who are interested in helping with environmental issues have little interest in or affinity for the science involved in the program. Because it is believed that the relatively low enrollment in this particular program is related largely to the lack of awareness of 1. The existence of the program and 2. The career paths associated with graduates of the program, a large part of the focus should be in enhancing awareness of the program at Lander and in the state, especially relating the program to careers.

5.8. CHANGES MADE/PROPOSED TO PROGRAM AS A RESULT OF OUTCOMES 1-5: One proposed change is the addition of a new introductory course ES 111, which will be available to ES majors and to general education students at Lander, starting as early as Spring 2019. This new course will do two things: 1. Increase awareness at Lander regarding the subject of environmental science and the existence of the ES program and 2. Help a learning community among ES students to develop, thus increasing the chance that more students will remain in the major, rather than transferring. Another set of changes is to increase the recruiting effort into the program by reaching out to high schools in the state and surrounding region. Activities of the Environmental Science Student Organization (ESSO) also are of importance in creating awareness around campus and in the community. ESSO membership includes students from across campus. Dr. Diana Delach is the faculty coordinator/mentor for the group, and she has done much to plan and coordinate activities with members.