



INTERIM Assessment Report (assessment results from AY 2014-15):

Geological Sciences Department

- **BS and BSED in Earth Science**
- **General Education**

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Overview

Department: Geological Sciences

Report Preparer: Kristine Larsen

Program Name and Level: BS and BSED Earth Science (Undergraduate)

Program Assessment Question	Response
1) URL: Provide the URL where the learning outcomes (LO) can be viewed.	http://web.ccsu.edu/geosci/esci-outcomes.shtml
2) LO Changes: Identify any changes to the LO and briefly describe why they were changed (e.g., LO more discrete, LO aligned with findings)	none
3) Strengths: What about your assessment process is working well?	Our process assesses a variety of important skills that our students are expected to achieve before graduation that will prepare them for both employment and graduate school.
4) Improvements: What about your assessment process needs to improve? (a brief summary of changes to assessment plan should be reported here)	As noted in Appendix A, this is the first year of a revised assessment plan, and assessment instruments are not yet in place for all pieces of the assessment structure. This will be addressed in the 2015-16 academic year cycle of assessment.
For Each Learning Outcome (LO) complete questions 5, 6 and 7 (you may add more rows if you have more than 5 LOs):	
LO #1) Scientific literacy: Students will be able to identify, analyze, and apply earth science concepts, principles, laws, and theories.	
5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review and scoring rubric, licensure examination, , etc.)	Baseline data: ESCI 145 Earth and Life History Lab: fossil ID exam Upper level data: ESCI 221 Mineralogy: "Unknown mineral" assignment: Students will learn about the procedure of identifying an unknown mineral, learn about mineral properties, and how to read scientific literature on minerals.
6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.	faculty
7) Results: Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	Conclusion: The vast majority of upper level majors exceeded this expectation, while the vast majority of beginning majors only met this outcome.
	Evidence: Conclusion based on table in Appendix A
	Changes: None needed at this time

LO #2) Ability to do science: Students will be able to interpret, analyze, and apply the Scientific Method and other related inquiry related skills, as well as quantitative methods, in the earth science lab.	
5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)	<p>a) Scientific Method: Baseline data: ESCI 145 Earth and Life History Lab: Final project</p> <p>Upper level data: ESCI 221 Mineralogy: "Unknown mineral" assignment: Students will be given an unknown mineral that they need to test the properties of, look up those properties and try to identify the mineral based on those properties. They will come up with a first guess at to the identification. They will then prepare a sample for X-Ray diffraction, and run their sample. They will then use published comparison charts to completely identify the mineral.</p> <p>b) Quantitative methods: Baseline data: ESCI 125 The Dynamic Earth Lab: Hydrologic Budget exercise</p> <p>Upper level data: ESCI 221 Mineralogy: "Unknown mineral" assignment: Using their XRD data, students will need to calculate d-spacings of the crystal lattice.</p>
6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.	faculty
7) Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	<p>Conclusion:</p> <p>a) While the number of BSED majors was too small to have statistical significance, it is seen that the BS majors overwhelmingly exceeded this outcome by the time they were in upper level classes, but were still developing as introductory students.</p> <p>b) While the number of BSED majors was too small to have statistical significance, it is seen that the BS majors overwhelmingly exceeded this outcome by the time they were in upper level classes, but were still developing as introductory students.</p>
	Evidence: Conclusion based on table in Appendix A
	Changes: None needed at this time
LO #3) Communications: Students will be able to use oral and written communication to accurately and effectively convey earth science concepts.	
5) Assessment Instruments: For each LO, what is the source of the data/evidence,	a) Oral communication: Baseline data:

<p>other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)</p>	<p>None</p> <p>Upper level data: ESCI 360 Research in Earth Sciences: Presentation of research grant proposal (for BS students) ESCI 278 Observational Astronomy: Demonstrated ability to communicate astronomical knowledge clearly and factually correctly to the general public during capstone public observing sessions. OR ESCI 290 Field Methods: Oral assignment (TBD) (for BSED students)</p> <p>b) Written communication: Baseline data: None</p> <p>Upper level data: ESCI 360 Research in Earth Sciences: Written research grant proposal (BS students)</p> <p>ESCI 278 Observational Astronomy: Written research paper on a particular constellation. or ESCI 290 Field Methods: Written assignment (TBD) (BSED students)</p>
<p>6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.</p>	<p>faculty</p>
<p>7) Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).</p>	<p>Conclusion: Evidence suggests that BS majors have satisfactory proficiency in both oral and written communication. There were no BSED students enrolled in these courses in this academic year.</p> <hr/> <p>Evidence: Conclusion based on table in Appendix A</p> <hr/> <p>Changes: A new assessment in GEO 131 (the old ESCI 131) will measure oral and written proficiency at the 100 level beginning with the Fall 2015 semester. Assessments in higher level courses will be developed during the 2015-16 assessment cycle.</p>

LO #4) Technology literacy: Students will be able to select and accurately use appropriate tools, equipment, and technologies in the earth science lab.	
5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)	<p>Baseline data: None</p> <p>Upper level data: ESCI 290 Field Methods: Technology capability of each student will be assessed based on ability: 1: to use Brunton compass for mapping geologic outcrops and features. 2: to use Geographic Information System (GIS) software for preparing pace and compass map 3: to collect, and analyze water quality using water testing equipment 4: to collect and determine soil properties using Munsell color charts and hydrometers 5: to use remote sensing techniques for geologic mapping AND ESCI 278 Observational Astronomy: Demonstrated ability to set-up and operate portable and observatory telescopes to view a number of astronomical objects during a lab practicum (observing session).</p>
6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.	Faculty
7) Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	<p>Conclusion: No baseline data for introductory students could be obtained due to equipment failure. These issues have now been corrected. Upper level BS students demonstrated satisfactory proficiency. No BSED students were enrolled in the relevant courses during the 2014-15 academic year.</p> <p>Evidence: Conclusion based on table in Appendix A</p> <p>Changes: None needed at this time.</p>
LO #5) Research: Students will be able to locate, interpret, analyze, and/or conduct and present earth science research.	
5) Assessment Instruments: For each LO, what is the source of the data/evidence, other than GPA, that is used to assess the stated outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)	<p>Baseline data: None</p> <p>Upper level data: ESCI 360 Research in Earth Sciences: Written research grant proposal AND ESCI 221: Students will research their mineral using reference books and journal articles to make sure they have the correct identification. They will then write a 2-3 page final report on their mineral.</p>
6) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by LO, provide information by LO.	Faculty

7) Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	Conclusion: Due to changes in faculty assignments, the planned assessment instrument was not administered in the introductory course during 2014-15. This will be addressed in the 2015-16 assessment cycle. While the number of BSED upper level majors was too small to provide statistically relevant results, the BS students performed satisfactorily.
	Evidence: Conclusion based on table in Appendix A
	Changes: A new assessment in GEO 131 (the old ESCI 131) will measure a student's ability to do basic literature research at the 100 level beginning with the Fall 2015 semester.

Appendix A: Majors Assessment Plan

In the previous (2013-14) report it was noted that after discussions with the Chair of the university Academic Assessment Committee it was decided that targeted assessment of students in required 100 level majors courses would provide a useful baseline against which to measure student achievement in upper level course. This poses some difficulty, because both BS and BSED majors have the choice as to whether to take ESCI 121/125 or 131/135. It was decided to use both courses (albeit for different LO) in order to capture some LO for students in each course. In addition, some of the upper level courses have been revised, meaning that different assignments had to be selected in order to capture the required assessment data. Again, since there is some choice (specifically with the BSED students) whether to take ESCI 278 Observational Astronomy or ESCI Field Methods, and ESCI 360 is an elective for BSED students, a one-size-fits-all assessment plan was difficult to construct. The revised assessment plan (utilized in the 2014-2015 academic year) appears below (including data collected):

Outcome MAJORS (BS and BSED)	100 level BS	100 level BSED	Upper level BS	Upper level BSED
Scientific literacy	ESCI 145 Earth and Life History Lab: fossil ID exam N = 9 Exceeded: 22% Met: 56% Failed: 22%	ESCI 145 Earth and Life History Lab: fossil ID exam N = 2 Exceeded: 0% Met: 100% Failed: 0%	ESCI 221 Mineralogy: "Unknown mineral" assignment: Students will learn about the procedure of identifying an unknown mineral, learn about mineral properties, and how to read scientific literature on minerals. <i>N = 7</i> <i>Exceeded: 85.7%</i> <i>Met: 14.3%</i> <i>Failed: 0.0%</i>	ESCI 221 Mineralogy: "Unknown mineral" assignment: Students will learn about the procedure of identifying an unknown mineral, learn about mineral properties, and how to read scientific literature on minerals <i>N = 2</i> <i>Exceeded: 100%</i> <i>Met: 0%</i> <i>Failed: 0%</i>
Ability to do science: Scientific Method	ESCI 145 Earth and Life History Lab: Final project	ESCI 145 Earth and Life History Lab: Final project	ESCI 221 Mineralogy: "Unknown mineral" assignment: Students will be given an unknown mineral	ESCI 221 Mineralogy: "Unknown mineral" assignment: Students will be given an unknown mineral

	<p>N = 9</p> <p>Exceeded = 44.5%</p> <p>Met = 22%</p> <p>Failed = 33.5%</p>	<p>N = 2</p> <p>Exceeded = 50%</p> <p>Met = 50%</p> <p>Failed = 0%</p>	<p>that they need to test the properties of, look up those properties and try to identify the mineral based on those properties. They will come up with a first guess at to the identification. They will then prepare a sample for X-Ray diffraction, and run their sample. They will then use published comparison charts to completely identify the mineral.</p> <p>“Unknown mineral” assignment: [Testing properties; X-ray diffraction sample; mineral identification] <i>N=7 BS/2 BSED</i> <i>BS:</i> <i>Exceeded: 85.7%</i> <i>Met: 14.3%</i> <i>Failed: 0.0%</i> <i>BSED:</i> <i>Exceeded: 100%</i> <i>Met: 0%</i> <i>Failed: 0%</i></p>	<p>that they need to test the properties of, look up those properties and try to identify the mineral based on those properties. They will come up with a first guess at to the identification. They will then prepare a sample for X-Ray diffraction, and run their sample. They will then use published comparison charts to completely identify the mineral.</p> <p>“Unknown mineral” assignment: [Testing properties; X-ray diffraction sample; mineral identification] <i>N=7 BS/2 BSED</i> <i>BS:</i> <i>Exceeded: 85.7%</i> <i>Met: 14.3%</i> <i>Failed: 0.0%</i> <i>BSED:</i> <i>Exceeded: 100%</i> <i>Met: 0%</i> <i>Failed: 0%</i></p>
<p>Ability to do science: Math</p>	<p>ESCI 125 The Dynamic Earth Lab: Hydrologic Budget exercise</p> <p>N = 10</p> <p>Exceeded = 30%</p> <p>Met = 50%</p> <p>Failed = 20%</p>	<p>ESCI 125 The Dynamic Earth Lab: Hydrologic Budget exercise</p> <p>N = 2</p> <p>Exceeded = 50%</p> <p>Met = 0%</p> <p>Failed = 50%</p>	<p>ESCI 221 Mineralogy: “Unknown mineral” assignment: Using their XRD data, students will need to calculate d-spacings of the crystal lattice.</p> <p>“Unknown mineral” assignment: [calculate d-spacings of the crystal lattice] <i>N=7 BS/2 BSED</i> <i>BS:</i> <i>Exceeded: 100.0%</i> <i>Met: 0%</i> <i>Failed: 0%</i> <i>BSED:</i></p>	<p>ESCI 221 Mineralogy: “Unknown mineral” assignment: Using their XRD data, students will need to calculate d-spacings of the crystal lattice.</p> <p>“Unknown mineral” assignment: [calculate d-spacings of the crystal lattice] <i>N=7 BS/2 BSED</i> <i>BS:</i> <i>Exceeded: 100.0%</i> <i>Met: 0%</i> <i>Failed: 0%</i> <i>BSED:</i></p>

			<p><i>Exceeded: 100%</i> <i>Met: 0%</i> <i>Failed: 0%</i></p>	<p><i>Exceeded: 100%</i> <i>Met: 0%</i> <i>Failed: 0%</i></p>
Oral communication	TBD	TBD	<p>ESCI 360 Research in Earth Sciences: Presentation of research grant proposal</p> <p><i>N = 11</i></p> <p><i>Exceeds = 27%</i> <i>Meets= 55%</i> <i>Fails=18%</i></p>	<p>ESCI 278 Observational Astronomy: Demonstrated ability to communicate astronomical knowledge clearly and factually correctly to the general public during capstone public observing sessions.</p> <p><i>No BSED students were enrolled in ESCI 278 in 2014-15</i></p> <p>OR</p> <p>ESCI 290 Field Methods: Oral assignment (TBD)</p> <p>N=0</p> <p>An assignment was not developed in time to be included in the Fall 2014 section of the course.</p>
Written communication	TBD	TBD	<p>ESCI 360 Research in Earth Sciences: Written research grant proposal</p> <p><i>N=11</i></p> <p><i>Exceeds=18%</i> <i>Meets=55%</i> <i>Fails=27%</i></p>	<p>ESCI 278 Observational Astronomy: Written research paper on a particular constellation.</p> <p><i>No BSED students were enrolled in ESCI 278 in 2014-15</i></p> <p>OR</p> <p>ESCI 290 Field Methods: Written assignment (TBD)</p>

				<i>No BSED students were enrolled in ESCI 278 in 2014-15</i>
Technology literacy (tools both electronic and manual)	<p>ESCI 135 Environmental Geoscience Lab: Laboratory exercise the use of pH meter and potable photometer for water chemistry analysis.</p> <p>The meters malfunctioned and we could not use them for this lab exercise.</p>	<p>ESCI 135 Environmental Geoscience Lab: Laboratory exercise the use of pH meter and potable photometer for water chemistry analysis.</p> <p>The meters malfunctioned and we could not use them for this lab exercise.</p>	<p>ESCI 290 Field Methods: Technology capability of each student will be assessed based on ability:</p> <p>1: to use Brunton compass for mapping geologic outcrops and features.</p> <p>2: to use Geographic Information System (GIS) software for preparing pace and compass map</p> <p>3: to collect, and analyze water quality using water testing equipment</p> <p>4: to collect and determine soil properties using Munsell color charts and hydrometers</p> <p>5: to use remote sensing techniques for geologic mapping</p> <p><i>N=10</i></p> <p><i>Exceeds=20%</i></p> <p><i>Meets=70%</i></p> <p><i>Fails=10%</i></p>	<p>ESCI 278 Observational Astronomy: Demonstrated ability to set-up and operate portable and observatory telescopes to view a number of astronomical objects during a lab practicum (observing session).</p> <p><i>No BSED students were enrolled in ESCI 278 in 2014-15</i></p> <p>OR</p> <p>ESCI 290 Field Methods: Technology capability of each student will be assessed based on ability:</p> <p>1: to use Brunton compass for mapping geologic outcrops and features.</p> <p>2: to use Geographic Information System (GIS) software for preparing pace and compass map</p> <p>3: to collect, and analyze water quality using water testing equipment</p> <p>4: to collect and determine soil properties using Munsell color charts and hydrometers</p> <p>5: to use remote sensing techniques for geologic mapping</p> <p><i>No BSED students were enrolled in ESCI 278 in 2014-15</i></p>

Research	<p>ESCI 121 The Dynamic Earth: Geology of State Parks Assignment</p> <p>Assignment was not assigned due to a shift in personnel teaching the course.</p>	<p>ESCI 121 The Dynamic Earth: Geology of State Parks Assignment</p> <p>Assignment was not assigned due to a shift in personnel teaching the course.</p>	<p>ESCI 360 Research in Earth Sciences: Written research grant proposal</p> <p><i>N=11</i></p> <p><i>Exceeds=18%</i></p> <p><i>Meets=55%</i></p> <p><i>Fails=27%</i></p>	<p>ESCI 221: Students will research their mineral using reference books and journal articles to make sure they have the correct identification. They will then write a 2-3 page final report on their mineral.</p> <p><i>N= 2</i></p> <p><i>Exceeded: 100%</i></p> <p><i>Met: 0%</i></p> <p><i>Failed: 0%</i></p>
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Note that assessments at the baseline (100) level for Oral and written communication were not developed for the 2014-15 academic year.

Strengths: The program (as revised) uses a variety of lecture and laboratory courses to assess student learning, although we have endeavored to limit it to one course/assessment per LO (with the exception of BSED students who have a choice as to whether to take ESCI 278 or 290 – now AST 278 and GEO 290) in order to make the comparisons fair. After a few years of collecting data we should be able to see if the upper level courses are providing “value added” in terms of increases in student success from the baseline to upper level.

Improvements: As noted above, a number of new assessment tools have now been crafted, and are in place for the 2015-16 assessment cycle. In addition, assessments that were not able to be completed due to equipment issues are now being successfully deployed.

General Education: Here is the URL for the list of approved general education courses and LO/objectives:
<http://web.ccsu.edu/registrar/classesregistration/generalEduProgram.asp>

NOTE: If department contributes to more than one LO, complete one summary for each LO

Department: Geological Sciences

General Education LO Assessed: SU1. Explain how scientists think, work, and evaluate the natural and social world

Report Preparer: Kristine Larsen

General Education Question	Response
1) Courses: General Education course(s) taught	ESCI 100 Search in Geological Sciences ESCI 101 Search in Geological Sciences with Laboratory ESCI 102 Earth and the Human Environment ESCI 112 Search for Life on Other Planets ESCI 113 The Cosmos ESCI 121 The Dynamic Earth ESCI 125 The Dynamic Earth Lab ESCI 129 Introduction to Meteorology ESCI 131 Environmental Geoscience ESCI 135 Environmental Geoscience Lab ESCI 141 Earth and Life History ESCI 145 Earth and Life History Lab ESCI 208 Planetary Astronomy ESCI 209 Stellar and Galactic Astronomy ESCI 278 Observational Astronomy
2) Assessment Instruments: What data/evidence, other than GPA, is used to assess the stated CCSU General Education outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)	ESCI 209 Stellar Astronomy: Capstone lab assignment
3) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by XX course, provide information by XX course.	Faculty
4) Results: Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	Conclusion: Students were largely able to demonstrate that they had met expectations for this assignment. Evidence: Conclusion based on table in Appendix B

	Changes: None were made or are being planned at this time.
5) Strengths: What about your assessment process is working well?	Since it is based on an authentic scientific scenario, it was deemed an appropriate measure of student mastery of this LO.
6) Improvements: What about your assessment process needs to improve? (changes to assessment plan should be reported here)	Students need to somehow be convinced to complete this assignment.

NOTE: If department contributes to more than one LO, complete one summary for each LO

Department: Geological Sciences

General Education LO Assessed: SU2a. Use techniques such as controlled observation, experiment and SU2b. Use techniques such as mathematical analysis of data, and production and interpretation of graphical and tabular data presentation.

Report Preparer: Kristine Larsen

General Education Question	Response
1) Courses: General Education course(s) taught	ESCI 100 Search in Geological Sciences ESCI 101 Search in Geological Sciences with Laboratory ESCI 102 Earth and the Human Environment ESCI 112 Search for Life on Other Planets ESCI 113 The Cosmos ESCI 121 The Dynamic Earth ESCI 125 The Dynamic Earth Lab ESCI 129 Introduction to Meteorology ESCI 131 Environmental Geoscience ESCI 135 Environmental Geoscience Lab ESCI 141 Earth and Life History ESCI 145 Earth and Life History Lab ESCI 208 Planetary Astronomy ESCI 209 Stellar and Galactic Astronomy ESCI 278 Observational Astronomy
2) Assessment Instruments: What data/evidence, other than GPA, is used to assess the stated CCSU General Education outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)	ESCI 209 Stellar Astronomy: Spectra Lab Exercise; ESCI 209 Stellar Astronomy: Blackbody Radiation and Wien's Law Lab Exercise

3) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by XX course, provide information by XX course.	Faculty
4) Results: Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	Conclusion: a) As noted, for the past two years students have largely exceeded expectations. b) As expected, students have greater difficulty with mathematical techniques, but the vast majority at least meet the expectations.
	Evidence: Conclusion based on table in Appendix B
	Changes: None needed at this time.
5) Strengths: What about your assessment process is working well?	The laboratory assignments integrate a number of different scientific techniques, such as observation, inference, and drawing conclusions, as well as graph analysis and mathematical analysis. They are authentic experiences.
6) Improvements: What about your assessment process needs to improve? (changes to assessment plan should be reported here)	None needed at this time.

NOTE: If department contributes to more than one LO, complete one summary for each LO

Department: Geological Sciences

General Education LO Assessed: SU3. Demonstrate knowledge and appreciation of the natural and social world.

Report Preparer: Kristine Larsen

General Education Question	Response
1) Courses: General Education course(s) taught	ESCI 100 Search in Geological Sciences ESCI 101 Search in Geological Sciences with Laboratory ESCI 102 Earth and the Human Environment ESCI 112 Search for Life on Other Planets ESCI 113 The Cosmos ESCI 121 The Dynamic Earth ESCI 125 The Dynamic Earth Lab ESCI 129 Introduction to Meteorology ESCI 131 Environmental Geoscience ESCI 135 Environmental Geoscience Lab ESCI 141 Earth and Life History ESCI 145 Earth and Life History Lab ESCI 208 Planetary Astronomy ESCI 209 Stellar and Galactic Astronomy

	ESCI 278 Observational Astronomy
2) Assessment Instruments: What data/evidence, other than GPA, is used to assess the stated CCSU General Education outcomes? (e.g., capstone course, portfolio review, licensure examination, etc.)	ESCI 102 Earth and the Human Environment: Climate Change across the Solar System essay
3) Interpretation: Who interprets the evidence? (e.g., faculty, Admn. assistant, etc.). If this differs by XX course, provide information by XX course.	Faculty
4) Results: Since the most recent full report, state the conclusion(s) drawn and what changes have been made as a result of the conclusion(s).	Conclusion: Students largely met the expected goals for this learning outcome.
	Evidence: Conclusion based on table in Appendix B
	Changes: Prior to 2014-15 a different assessment tool was used for SU3, the ESCI 131 Environmental Geology: Geology and the Environment term paper. The instructor of ESCI 131 was not satisfied with the level of depth of the assignment, which resulted in an unusually high “exceeded” percentage among students (see above). It was decided to change the assessment of this LO to a similar essay assignment in ESCI 102 Earth and the Human Environment, a course that solely serves nonmajors. The results are dramatic. The number of “exceeds” has dropped precipitously and is more in line with an assignment that honestly challenges students to apply their understanding. While the number of “fails” is unfortunately high, all but one of these students simply chose not to do the assignment. Therefore, students who did the assignment were unequivocally successful in demonstrating that they met the learning outcome in this area.
5) Strengths: What about your assessment process is working well?	The assessment assignment was based on students’ ability to synthesize information drawn from outside of the textbook, and compare climate change on Earth and other bodies in the solar system. Students were sufficiently challenged but largely met that challenge.
6) Improvements: What about your assessment process needs to improve? (changes to assessment plan should be reported here)	None are needed at this time.

Appendix B: General Education Narrative:

The General Education assessment for the department was overhauled in 2013-2014. The resulting assessment structure and resulting data is listed below for both 2013-14 and 2014-15. *Exceeded* expectations is defined as a grade of A or A- on the assignment, *met* expectations is defined as a grade of B+ through C- on the assignment, and *failed* to meet expectations refers to grades below C- and assignments not turned in by the student.

LO	Assessment	Data
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<p>SU1. Explain how scientists think, work, and evaluate the natural and social world</p>	<p>ESCI 209 Stellar Astronomy: Capstone lab assignment</p>	<p>2014-15: N=29</p> <p><i>Exceeds: 31%</i> <i>Meets: 45%</i> <i>Fails: 24%</i></p> <p>2013-14: N = 27</p> <p><i>Exceeds: 51.9%</i> <i>Meets: 29.6%</i> <i>Fails: 18.5%</i></p>
<p>SU2a. Use techniques such as controlled observation, experiment</p>	<p>ESCI 209 Stellar Astronomy: Spectra Lab Exercise</p>	<p>2014-15: N=32</p> <p><i>Exceeds: 84.5%</i> <i>Meets: 12.5%</i> <i>Fails: 3%</i></p> <p>2013-14: N = 28</p> <p><i>Exceeds: 78.6%</i> <i>Meets: 17.8%</i> <i>Fails: 3.6%</i></p>
<p>SU2b. Use techniques such as mathematical analysis of data, and production and interpretation of graphical and tabular data presentation.</p>	<p>ESCI 209 Stellar Astronomy: Blackbody Radiation and Wien's Law Lab Exercise</p>	<p>2014-15: N=32</p> <p><i>Exceeds: 44%</i> <i>Meets: 47%</i> <i>Fails: 9%</i></p> <p>2013-14: N = 28</p> <p><i>Exceeds: 60.7%</i> <i>Meets: 35.7%</i></p>

<p>SU3. Demonstrate knowledge and appreciation of the natural and social world.</p>	<p>ESCI 102 Earth and the Human Environment: Climate Change across the Solar System essay</p>	<p><i>Fails: 3.6%</i></p> <p><i>2014-15:</i></p> <p><i>N=42</i></p> <p><i>Exceeds= 10%</i> <i>Meets=69%</i> <i>Fails=21%</i></p> <p><i>2013-14: ESCI 131 Environmental Geology: Geology and the Environment term paper</i> <i>N = 57</i></p> <p><i>Exceeds: 86%</i> <i>Meets: 14%</i> <i>Fails: 0%</i></p>
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The unusually high percentage of students who “failed” the ESCI 209 capstone in both years was due to students electing not to hand in the assignment. Since it is only worth 5% of the course grade, some students may not have taken the assignment seriously. In the Spring 2015 semester the instructor endeavored to better impress upon the students the importance of completing this assignment, but a number still chose to not hand it in. This included students who were otherwise doing very well in the course.

Strengths:

Improvements: Prior to 2014-15 a different assessment tool was used for SU3, the ESCI 131 Environmental Geology: Geology and the Environment term paper. The instructor of ESCI 131 was not satisfied with the level of depth of the assignment, which resulted in an unusually high “exceeded” percentage among students (see above). It was decided to change the assessment of this LO to a similar essay assignment in ESCI 102 Earth and the Human Environment, a course that solely serves nonmajors. The results are dramatic. The number of “exceeds” has dropped precipitously and is more in line with an assignment that honestly challenges students to apply their understanding. While the number of “fails” is unfortunately high, all but one of these students simply chose not to do the assignment. Therefore, students who did the assignment were unequivocally successful in demonstrating that they met the learning outcome in this area. No further improvements are planned at this time.