

Program Outcomes Assessment

BA/BS in Earth

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General Information (Program Outcomes Assessment)

File Attachments:

1. Geology (See appendix)

Geology Assessment Plan

2. Geology (See appendix)

Geology Assessment Strategy

Standing Requirements

📖 Mission Statement

The mission of the Earth and Environmental Sciences major is to provide undergraduate education grounded in the geosciences in order to prepare students for environmentally oriented careers and/or graduate studies.

The program is committed to interdisciplinary studies of the environment, the earth, and human interaction with the environment with an emphasis on experiential learning and community engagement.

📖 Outcomes Library

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Outcome	Mapping
Interdisciplinary Demonstrate an understanding that environmental issues are fundamentally interdisciplinary	No Mapping

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Outcome	Mapping
Interconnectedness Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world	No Mapping

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Outcome	Mapping
Data Analysis Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory	Foundational Studies: IIIa. Quantitative Literacy

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Outcome	Mapping
Communication Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing	Foundational Studies: 10. Express themselves effectively, professionally, and persuasively both orally and in writing.

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

Outcome

Mapping

concepts

No Mapping

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

Outcome

Mapping

geological processes

No Mapping

Demonstrate an Understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Outcome

Mapping

Atmospheric and Surface Processes

No Mapping

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Outcome

Mapping

Synthesize geologic history

No Mapping

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

Outcome

Mapping

spatio-temporal analysis

No Mapping

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

Curriculum Map

Active Curriculum Maps

Earth & Environmental Sciences (See appendix)

Alignment Set: BA/BS in Earth & Environmental Sciences Outcome Set

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Communication of Outcomes

Learning outcomes will be posted on the department of Earth and Environmental Systems web site as well as being posted on department bulletin boards in the Science building hallway.

Archive (This area is to be used for archiving pre-TaskStream assessment data and for current documents.)

 **Archive**

2010-2011 Assessment Cycle

Assessment Plan

Outcomes and Measures

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

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Responsible Individual(s): Concentration Advisors

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

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Concepts

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concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

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Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

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committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

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spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

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Responsible Individual(s): Concentration Advisors

Assessment Findings

Finding per Measure

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

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Findings for Testing

No Findings Added

Physical and Cultural Interconnectedness (core)

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Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

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Direct - Other

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Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

No Findings Added

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

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Findings for Projects

No Findings Added

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

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Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

No Findings Added

Geological Processes (geosciences concentration)

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geological processes

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Findings for Course outcomes & Exit Exam

No Findings Added

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Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

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Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

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Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Overall Recommendations

No text specified

Overall Reflection

No text specified

2011-2012 Assessment Cycle

Assessment Plan

Outcomes and Measures

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

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Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ Measure: Projects Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

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Responsible Individual(s): ENVI 460 Instructor

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Effectively synthesize and communicate research findings both orally and in writing

Communication

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Concepts

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Responsible Individual(s): Concentration Advisors

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Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

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Responsible Individual(s): Undergraduate Affairs Committee

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

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Responsible Individual(s): Concentration Advisors

Assessment Findings

Finding per Measure

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

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Direct - Exam

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Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2011-2012 assessment cycle for our "Interdisciplinary" program outcome show greater subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. On average, the students who have completed both core courses (12 students are in this category) scored higher than students who completed only one course (+1.3% over the 4 students who had completed only ENVI130, and +10.1% over the 3 students who had completed only ENVI110). Students who had taken neither core course (only 2 students are in this category) performed poorly on the assessment, scoring -9.8% on the assessment instrument.

Results: Target Achievement: Met

Recommendations : Response on the instrument was not as high as it could have been (only 22 out of 104 students completed the assessment). Some of this is due to the fact that students from legacy programs (e.g., "Geology" or "Geography" majors) either did not complete assessments, or completed an assessment specific to their legacy major. However, one recommendation would be to have advisors emphasize the need to take the assessment -- something the Undergraduate Affairs Committee Chair should work to enhance for the 2012-2013 Assessment Cycle.

Reflections/Notes : In future assessments we should monitor the performance of both our core courses. The outcomes of this assessment actually show that students who have taken neither core course do very slightly better on this instrument than those who have completed only ENVI110. While this is likely due to small-sample bias (only 2 students in the "no core courses taken" category, and only 3 in the "ENVI110 completed" category), it is a trend we should continue to monitor.

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ **Measure:** Testing
Direct - Exam

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Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2011-2012 assessment cycle for our "Interconnectedness" program outcome show greater subject mastery for students who have completed the courses which map to this outcome. Similar to our "interdisciplinary" outcome, both of core courses (ENVI110 and ENVI130) focus on the interconnectedness of ecological systems with physical and cultural aspects of our world. As these core courses are required of all majors, we assess these goals using the same test instrument, administered at various stages during the degree program. On average, the students who have completed both core courses (12 students are in this category) scored higher than students who completed only one course (+1.3% over the 4 students who had completed only ENVI130, and +10.1% over the 3 students who had completed only ENVI110). Students who had taken neither core course (only 2 students are in this category) performed poorly on the assessment, scoring -9.8% on the assessment instrument.

Results: Target Achievement: Met

Recommendations : Again, response rate was probably the most problematic aspect of this assessment (only 22 out of 104 students completed the assessment). The Undergraduate Affairs Committee Chair should work to enhance for the 2012-2013 Assessment Cycle.

Reflections/Notes : In future assessments we should monitor the performance of both our core courses. The outcomes of this assessment actually show that students who have taken neither core course do very slightly better on this instrument than those who have completed only ENVI110. While this is likely due to small-sample bias (only 2 students in the "no core courses

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

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Target:

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Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

Summary of Findings: This item was not assessed for the 2011-2012 Assessment Cycle, but will be assessed during the 2012-2013 Assessment Cycle.

[Note: for the 2011-2012 assessment cycle we were required to assess a single program outcome -- as a department we focused on our common core]

Results: Target Achievement: Not Met

Recommendations :

Reflections/Notes :

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ **Measure:** Projects
Direct - Other

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Findings for Projects

Summary of Findings: This item was not assessed for the 2011-2012 Assessment Cycle, but will be assessed during the 2012-2013 Assessment Cycle.

[Note: for the 2011-2012 assessment cycle we were required to assess a single program outcome -- as a department we focused on our common core]

Results: Target Achievement: Not Met

Recommendations :

Reflections/Notes :

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: Students completing the Geoscience concentration of the BS in Earth and Environmental Sciences major are required to complete an assessment instrument (text/exam) upon declaring the major, and must complete the same instrument before graduation. This assessment instrument focuses on their comprehension of primary principles, basic facts, and concepts which are crucial to the Geoscience concentration.

For the 2011-2012 Assessment Cycle, the 7 incoming first-year students in the Geoscience concentration completed the assessment instrument, earning an average score of 53.8%. Similarly, the 4 graduating senior students completed the same assessment, earning an average score of 84.16%. Graduating seniors earn a much higher score on the assessment instrument, appearing to indicate a significant learning gain (indeed, an unpaired t-test suggests that seniors earn a grade which is significantly higher, statistically speaking, at the 95% level of confidence).

Results: Target Achievement: Exceeded

Recommendations : It appears that students concentrating in Geosciences are realizing significant learning gains over the course of their program, suggesting the concentration is meeting this outcome goal exceptionally. The only recommendation would be to continue serving our students well and to keep up with ongoing assessment tasks.

Reflections/Notes :

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an Understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

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Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: Students completing the Geoscience concentration of the BS in Earth and Environmental Sciences major are required to complete an assessment instrument (text/exam)

upon declaring the major, and must complete the same instrument before graduation. This assessment instrument focuses on their comprehension of primary principles, basic facts, and concepts which are crucial to the Geoscience concentration.

For the 2011-2012 Assessment Cycle, the 7 incoming first-year students in the Geoscience concentration completed the assessment instrument, earning an average score of 53.8%. Similarly, the 4 graduating senior students completed the same assessment, earning an average score of 84.16%. Graduating seniors earn a much higher score on the assessment instrument, appearing to indicate a significant learning gain (indeed, an unpaired t-test suggests that seniors earn a grade which is significantly higher, statistically speaking, at the 95% level of confidence).

Results: Target Achievement: Exceeded

Recommendations : It appears that students concentrating in Geosciences are realizing significant learning gains over the course of their program, suggesting the concentration is meeting this outcome goal exceptionally. The only recommendation would be to continue serving our students well and to keep up with ongoing assessment tasks.

Reflections/Notes :

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: This item was not assessed for the 2011-2012 Assessment Cycle, but will be assessed during the 2012-2013 Assessment Cycle.

[Note: for the 2011-2012 assessment cycle we were required to assess a single program outcome -- as a department we focused on our common core]

Results: Target Achievement: Not Met

Recommendations :

Reflections/Notes :

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: This item was not assessed for the 2011-2012 Assessment Cycle, but will be assessed during the 2012-2013 Assessment Cycle.

[Note: for the 2011-2012 assessment cycle we were required to assess a single program outcome -- as a department we focused on our common core]

Results: Target Achievement: Not Met

Recommendations :

Reflections/Notes :

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ Measure: Testing Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: This item was not assessed for the 2011-2012 Assessment Cycle, but will be assessed during the 2012-2013 Assessment Cycle.

[Note: for the 2011-2012 assessment cycle we were required to assess a single program outcome -- as a department we focused on our common core]

Results: Target Achievement: Not Met

Recommendations :

Reflections/Notes :

Overall Recommendations

Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2011-2012 Cycle. In many respects the Geosciences concentration is ahead of most of our other concentrations given the longstanding entrance/exit exam model.

Another recommendation would be to work to enhance response rate for the core assessment for the 2012-2013 cycle. This will involve greater collaboration between advisors and the Undergraduate Affairs Committee Chairperson.

Overall Reflection

Ultimately, the initial major core-focused assessment effort we attempted this year does appear to indicate that the majority of responding students do appear to show learning gains when completing both courses of the common core, achieving higher scores on the assessment instrument than students who had not yet completed the core courses.

Furthermore, Geoscience concentration students assessed during this cycle appear to indicate that graduating seniors perform much better on their exit exam than incoming first-year students (seniors earn a 30.35% higher grade, on average, on the Geoscience entry/exit assessment instrument).

The core assessment as implemented for this assessment cycle had some shortcomings, chief of which was the response rate. This will need to be addressed by closer work with the Undergraduate Affairs Committee Chairperson and the concentration advisors. Another item which will become less and less of an issue as students in our legacy majors complete their degree programs.

For the 2012-2013 Assessment Cycle we will need to continue to implement our assessment plan, expanding to collect data and complete assessments for our other program outcomes.

Action Plan

Actions

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2011-2012 Cycle. In many respects the Geosciences concentration is ahead of most of our other concentrations given the longstanding entrance/exit exam model.

Another recommendation would be to work to enhance response rate for the core assessment for the 2012-2013 cycle. This will involve greater collaboration between advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel:

Measures:

Resource Allocations:

Priority:

Status Report

Action Statuses

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2011-2012 Cycle. In many respects the Geosciences concentration is ahead of most of our other

concentrations given the longstanding entrance/exit exam model.

Another recommendation would be to work to enhance response rate for the core assessment for the 2012-2013 cycle. This will involve greater collaboration between advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel:

Measures:

Resource Allocations:

Priority:

Status for Recommendations

No Status Added

Status Summary

No text specified

Summary of Next Steps

No text specified

2012-2013 Assessment Cycle

Assessment Plan

Outcomes and Measures

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same

committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Assessment Findings

Finding per Measure

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2012-2013 assessment cycle for our "Interdisciplinary" program outcome show greater subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. In every case the students who completed both core courses (3 students are in this category) scored well on the assessment post-test and one student who took both the pre-test and the post-test showed an identical score. In the case of this student, they took the pre-test two years after their entry into the program, and only one academic year before the post-test.

Results: Target Achievement: Met

Recommendations : Response on the instrument was not as high as it could have been (only 3 out of 4 students completed the assessment post-test). Some of this is due to the fact that students from legacy programs (e.g., "Geology" or "Geography" majors) either did not complete assessments, or completed an assessment specific to their legacy major. However, one recommendation would be to have advisors continue to emphasize the need to take the assessment -- something the Undergraduate Affairs Committee Chair is working increasing his efforts on the 2013-2014 Assessment Cycle.

Reflections/Notes : Two significant hurdles stand in the way of effective assessment, and neither are in control of the Department of Earth & Environmental Systems. First, since first-year advising is now the purview of the University College, the Department has very little initial contact with first-year majors, making it tough to get them to take the assessment pre-test. The Undergraduate Assessment Coordinator has asked the University College advisors to remind first-year majors to take the test, but it is hard to mandate they do so. The second major hurdle relates to this issue. There is no way to mandate students complete an assessment. The departmental Undergraduate Assessment Coordinator has contact the University Assessment center to ask about this and was redirected to the registrar. The registrar indicated that such a hold (one before registration for second-semester freshman year, and another before graduation checkout) would be very difficult, or perhaps impossible to implement.

Therefore the hurdle to assessment is, in part, that we have no power to demand these data from students.

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ Measure: Testing Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2012-2013 assessment cycle for our "Interconnectedness" program outcome show greater subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. In every case the students who completed both core courses (3 students are in this category) scored well on the assessment post-test and one student who took both the pre-test and the post-test showed an identical score. In the case of this student, they took the pre-test two years after their entry into the program, and only one academic year before the post-test.

Results: Target Achievement: Met

Recommendations : Response on the instrument was not as high as it could have been (only 3 out of 4 students completed the assessment post-test). Some of this is due to the fact that

students from legacy programs (e.g., "Geology" or "Geography" majors) either did not complete assessments, or completed an assessment specific to their legacy major. However, one recommendation would be to have advisors continue to emphasize the need to take the assessment -- something the Undergraduate Affairs Committee Chair is working increasing his efforts on the 2013-2014 Assessment Cycle.

Reflections/Notes : Two significant hurdles stand in the way of effective assessment, and neither are in control of the Department of Earth & Environmental Systems. First, since first-year advising is now the purview of the University College, the Department has very little initial contact with first-year majors, making it tough to get them to take the assessment pre-test. The Undergraduate Assessment Coordinator has asked the University College advisors to remind first-year majors to take the test, but it is hard to mandate they do so. The second major hurdle relates to this issue. There is no way to mandate students complete an assessment. The departmental Undergraduate Assessment Coordinator has contact the University Assessment center to ask about this and was redirected to the registrar. The registrar indicated that such a hold (one before registration for second-semester freshman year, and another before graduation checkout) would be very difficult, or perhaps impossible to implement.

Therefore the hurdle to assessment is, in part, that we have no power to demand these data from students.

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ Measure: Projects Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

Summary of Findings: Students in ENVI460 - Conservation and Sustainability, our "culminating experience" course are required to complete a personal research project which consists of a requirement to collect, analyze, interpret, and present (orally and in written form) a final project.

One of the beneficial aspects of having ENVI460 as our culminating experience course is that we are able to compare how our students do compared with non-majors who are also allowed to take the course. For the Spring 2013 semester (ENVI460 is offered annually every spring) BS in Earth & Environmental Sciences (BS in EES) majors outperformed their non-major colleagues by 2% in terms of final grades. The average personal project grade for Spring 2013 ENVI460 students who were BS in EES majors was 81.27%, with a maximum of 96.7 and a minimum of 0 (a major stopped attending the course, leaving that student out the minimum grade was a 66%). Overall grades for BS in EES majors in the course were high, with an average of 84%, but a median of 85.4% -- one BS in EES major's grade suffered overall (though not on the data analysis outcome) due to missing a component of the course. Another stopped attending early in the semester.

Results: Target Achievement: Met

Recommendations : The recommendation is to continue offering ENVI460 as a culminating experience course. One issue is the online version of ENVI460, which the department has decided should not be available to Majors in the BS or BA programs in the department. However, keeping our students out of that class has proven difficult, particularly since there is no advising hold on upperclassmen's registration.

Reflections/Notes :

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

Summary of Findings: The instructors (Jim Speer and Eric Anderson) of both Spring 2013 ENVI460 sections certified that of the 15 BS in EES majors who enrolled in ENVI460, 14 completed the communication outcome of our assessment plan. Given that all ENVI 460 students must collect, interpret, and analyze original data as part of their personal and group research projects in this class, and that they also have to present their research orally and as a written report. the target achievement was met.

They are given the opportunity to present their work as a poster presentation at Earth Day as well.

Results: Target Achievement: Met

Recommendations : Continue with the ENVI460 culminating experience as is.

Reflections/Notes :

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the three respondents to this assessment, the average increase in score between pre-test and post-test attempts was a highly significant (at the 99% level) of 29%,

Results: Target Achievement: Exceeded

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an Understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the three respondents to this assessment, the average increase in score between pre-test and post-test attempts was a highly significant (at the 99% level) of 29%,

Results: Target Achievement: Exceeded

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: This item was not assessed for the 2012-2013 Assessment Cycle, but may be assessed during the 2013-2014 Assessment Cycle.

[Note: for the 2013-2014 assessment cycle we have not yet decided which program assessment items to focus efforts on adding to our program assessment]

Results: Target Achievement: Met

Recommendations :

Reflections/Notes :

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the three respondents to this assessment, the average increase in score between pre-test and post-test attempts was a highly significant (at the 99% level) of 29%,

Results: Target Achievement: Met

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the three respondents to this assessment, the average increase in score between pre-test and post-test attempts was a highly significant (at the 99% level) of 29%.

Results: Target Achievement: Met

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Overall Recommendations

Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2013-2014 Cycle. In many respects the Geosciences concentration is ahead of most of our other concentrations given the longstanding entrance/exit exam model.

Another recommendation would be to work to enhance response rate for the core assessment for the 2013-2014 cycle. This will involve greater collaboration between advisors, the advisors of the University College, and the Department of Earth & Environmental Systems Undergraduate Affairs Committee Chairperson.

Overall Reflection

Ultimately, the initial major core-focused assessment effort we attempted this year does appear to indicate that all responding students do appear to show learning gains when completing both courses of the common core, achieving higher scores on the assessment instrument than students who had not yet completed the core courses.

Furthermore, Geoscience concentration students assessed during this cycle appear to indicate that graduating seniors perform much better on their exit exam than incoming first-year students (seniors earn a 29% higher grade, on average, on the Geoscience entry/exit assessment instrument).

The core assessment as implemented for this assessment cycle had some shortcomings, chief of which continues to be response rate. This will need to be addressed by closer work with the Undergraduate Affairs Committee Chairperson and the concentration advisors, although two hurdles stand in the way: (1) University College advisors now have more contact with our first-year students in an advisory capacity than departmental advisors do, and (2) there is no way to require response formally to these assessment efforts, hurting response rate.

Another item which will become less and less of an issue as students in our legacy majors complete their degree programs, we currently have only 2 undergraduate students working to complete a legacy major (Geology, Anthropology, or Geography). For the 2013-2014 Assessment Cycle we will need to continue to implement our assessment plan, expanding to collect data and complete assessments for our other program outcomes.

Action Plan

Actions

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2012-2013 Cycle. In many respects the Geosciences concentration is ahead of most of our other concentrations given the longstanding entrance/exit exam model. We will also consider changing when students are given pre- and post-assessment tests, but this is difficult given the lack of new-major contact due to University College Advising.

Another recommendation would be to work to enhance response rate for the core assessment for the 2012-2013 cycle. This will involve greater collaboration between advisors and the

Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel: The only person responsible for anything having to do with Assessment is Stephen Aldrich.

Measures:

Resource Allocations:

Priority:

 **Status Report**

Action Statuses

Action Plan

Outcome

Action Plan

▼ **Action: Recommendations**

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2012-2013 Cycle. In many respects the Geosciences concentration is ahead of most of our other concentrations given the longstanding entrance/exit exam model. We will also consider changing when students are given pre- and post-assessment tests, but this is difficult given the lack of new-major contact due to University College Advising.

Another recommendation would be to work to enhance response rate for the core assessment for the 2012-2013 cycle. This will involve greater collaboration between advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel: The only person responsible for anything having to do with Assessment is Stephen Aldrich.

Measures:

Resource Allocations:

Priority:

Status for Recommendations

No Status Added

Status Summary

We have expanded our assessment efforts to include assessment plan items for each concentration, in addition to maintaining core and culminating experience assessment items.

Summary of Next Steps

No text specified



2013-2014 Assessment Cycle

Assessment Plan

Outcomes and Measures

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ Measure: Testing Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ Measure: Testing Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ Measure: Projects Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same

committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Assessment Findings

Finding per Measure

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2012-2013 assessment cycle for our "Interdisciplinary" program outcome show greater subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. In every case the students who completed both core courses (7 students are in this category) increased their score on the assessment post-test compared with the pre-test, and the average improvement was 33%.

Results: Target Achievement: Met

Recommendations : Response on the instrument remains low, despite significant effort to engage majors. Some of this is due to the fact that students from legacy programs (e.g., "Geology" or "Geography" majors) either did not complete assessments, or completed an assessment specific to their legacy major. However, one recommendation would be to have advisors continue to emphasize the need to take the assessment -- something the Undergraduate Affairs Committee Chair is working increasing his efforts on the 2014-2015 Assessment Cycle. Furthermore, we are considering incorporating this pre-test instrument into our ENVI110 and ENVI130 sections to guarantee pre-test capture.

Reflections/Notes : Two significant hurdles stand in the way of effective assessment, and neither are in control of the Department of Earth & Environmental Systems. First, since first- and second-year advising is now the purview of the University College, the Department has very little initial contact with first-year majors, making it tough to get them to take the assessment pre-test. The Undergraduate Assessment Coordinator has asked the University College advisors to remind first-year majors to take the test, but it is hard to mandate they do so. The second major hurdle relates to this issue. There is no way to mandate students complete an assessment. The departmental Undergraduate Assessment Coordinator has contact the University Assessment center to ask about this and was redirected to the registrar. The registrar indicated that such a hold (one before registration for second-semester freshman year, and another before graduation checkout) would be very difficult, or perhaps impossible to implement.

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2013-2014 assessment cycle for our "Interconnectedness" program outcome show greater subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. In every case the students who completed both core courses (7 students are in this category) scored higher on the assessment post-test than the pre-test, with an increased average score of 33%.

Results: Target Achievement: Met

Recommendations :

Response on the instrument remains low, despite significant effort to engage majors. Some of this is due to the fact that students from legacy programs (e.g., "Geology" or "Geography" majors) either did not complete assessments, or completed an assessment specific to their legacy major. However, one recommendation would be to have advisors continue to emphasize the need to take the assessment -- something the Undergraduate Affairs Committee Chair is working increasing his

efforts on the 2014-2015 Assessment Cycle. Furthermore, we are considering incorporating this pre-test instrument into our ENVI110 and ENVI130 sections to guarantee pre-test capture.

Reflections/Notes :

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Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

Summary of Findings: Students in ENVI460 - Conservation and Sustainability, our "culminating experience" course are required to complete a personal research project which consists of a requirement to collect, analyze, interpret, and present (orally and in written form) a final project.

One of the beneficial aspects of having ENVI460 as our culminating experience course is that we are able to compare how our students do compared with non-majors who are also allowed to take the course. For the Spring 2014 semester (ENVI460 is offered annually every spring) BS in Earth & Environmental Sciences (BS in EES) majors outperformed their non-major colleagues in terms of final grades.

Results: Target Achievement: Met

Recommendations : The recommendation is to continue offering ENVI460 as a culminating experience course. One issue is the online version of ENVI460, which the department has decided should not be available to Majors in the BS or BA programs in the department. However, keeping our students out of that class has proven difficult, particularly since there is no advising hold on upperclassmen's registration.

Reflections/Notes :

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research

▼ **Measure:** Projects
Direct - Other

findings both orally and in writing

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

Summary of Findings: The instructor (Susan Berta) of Spring 2014 ENVI460 sections certified that of the all EES majors who enrolled in ENVI460, completed the communication outcome of our assessment plan. Given that all ENVI 460 students must collect, interpret, and analyze original data as part of their personal and group research projects in this class, and that they also have to present their research orally and as a written report. the target achievement was met. They are given the opportunity to present their work as a poster presentation at Earth Day as well.

Results: Target Achievement: Met

Recommendations : Continue with the ENVI460 culminating experience as is.

Reflections/Notes :

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

No Findings Added

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an Understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the four respondents to this assessment, the average increase in score between pre-test and post-test attempts was a highly significant (at the 99% level) of 34%.

Results: Target Achievement: Met

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: This item was not assessed for the 2013-2014 Assessment Cycle, but may be assessed during the 2014-2015 Assessment Cycle.

[Note: for the 2014-2015 assessment cycle we have not yet decided which program assessment items to focus efforts on adding to our program assessment]

Results: Target Achievement: Met

Recommendations :

Reflections/Notes :

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

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Results: Target Achievement: Met

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ Measure: Testing Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

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Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the four respondents to this assessment, the average increase in score between pre-test and post-test attempts was a highly significant (at the 99% level) of 34%.

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Overall Recommendations

Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2014-2015 Cycle. In many respects the Geosciences concentration remains ahead of most of our other concentrations given the longstanding entrance/exit exam model.

Another recommendation would be to work to enhance response rate for the core assessment for the 2014-2015 cycle. This will involve greater collaboration between advisors, the advisors of the University College, and the Department of Earth & Environmental Systems Undergraduate Affairs Committee Chairperson.

Overall Reflection

Ultimately, the initial major core-focused assessment effort we attempted this year does appear to indicate that all responding students do appear to show learning gains when completing both courses of the common core, achieving higher scores on the assessment instrument than students who had not yet completed the core courses.

Furthermore, Geoscience concentration students assessed during this cycle appear to indicate that graduating seniors perform much better on their exit exam than incoming first-year students (seniors earn a 34% higher grade, on average, on the Geoscience entry/exit assessment instrument).

The core assessment as implemented for this assessment cycle had some shortcomings, chief of which continues to be response rate. This will need to be addressed by closer work with the Undergraduate Affairs Committee Chairperson and the concentration advisors, although two hurdles stand in the way: (1) University College advisors now have more contact with our first-year students in an advisory capacity than departmental advisors do, and (2) there is no way to require response formally to these assessment efforts, hurting response rate.

Another item which will become less and less of an issue as students in our legacy majors complete their degree programs, we currently have only 2 undergraduate students working to complete a legacy major (Geology, Anthropology, or Geography). For the 2014-2015 Assessment Cycle we will need to continue to implement our assessment plan, expanding to collect data and complete assessments for our other program outcomes.

Action Plan

Actions

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core and culminating experience courses, and to expand the assessment data collection to include multiple concentration items for the 2014-2015 Cycle. We will also consider changing when students are given pre- and post-assessment tests, but this is difficult given the lack of new-major contact due to University College Advising.

Another recommendation would be to work continue to enhance response rate for the core assessment. This will involve greater collaboration between University College advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel: The only person responsible for anything having to do with Assessment is Stephen Aldrich.

Measures:

Resource Allocations:

Priority:

Status Report

Action Statuses

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core and culminating experience courses, and to expand the assessment data collection to include multiple concentration items for the 2014-2015 Cycle. We will also consider changing when students are given pre- and post-assessment tests, but this is difficult given the lack of new-major contact due to University College Advising.

Another recommendation would be to work continue to enhance response rate for the core assessment. This will involve greater collaboration between University College advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel: The only person responsible for anything having to do with Assessment is Stephen Aldrich.

Measures:

Resource Allocations:

Priority:

Status for Recommendations

Current Status: Completed

Resource Allocation(s) Status:

Next Steps/Additional Information: Though the cycle is complete, we recognize a need to improve response rates to our core assessment instrument.

Status Summary

No text specified

Summary of Next Steps

No text specified

2014-2015 Assessment Cycle

Assessment Plan

Outcomes and Measures

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

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Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

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Responsible Individual(s): Concentration Advisors

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

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Responsible Individual(s): ENVI 460 Instructor

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

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Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

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Details/Description: Faculty will evaluate course outcomes and results of exit exam.

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Responsible Individual(s): Undergraduate Affairs Committee

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Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

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Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same

committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

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Responsible Individual(s): Concentration Advisors

Assessment Findings

Finding per Measure

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

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Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2014-2015 assessment cycle for our "Interdisciplinary" program outcome show continued subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. In every case the students who completed both core courses (9 students are in this category) increased their score on the assessment post-test compared with the pre-test, and the average improvement was 27%.

Results: Target Achievement: Met

Recommendations : Response on the instrument continues to be low, despite significant effort to engage majors. During this assessment cycle, we employed the assistance of University College advisors to encourage students to take pre-core assessment instruments, and department advisors to encourage students to take post-core assessment instruments. Another recommendation would be to roll out the pre-test instrument into our ENVI110 and ENVI130 sections to guarantee pre-test capture, and to make the post-test instrument part of ENVI460 (our majors' culminating experience course).

Reflections/Notes : Two significant hurdles stand in the way of effective assessment, and neither are in control of the Department of Earth & Environmental Systems. First, since first- and second-year advising is now the purview of the University College, the Department has very little initial contact with first-year majors, making it tough to get them to take the assessment pre-test. The Undergraduate Assessment Coordinator has asked the University College advisors to remind first-year majors to take the test, but it is hard to mandate they do so. The second major hurdle relates to this issue. There is no way to mandate students complete an assessment. The departmental Undergraduate Assessment Coordinator has contacted the University Assessment center to ask about this and was redirected to the registrar. The registrar indicated that such a hold (one before registration for second-semester freshman year, and another before graduation checkout) would be very difficult, or perhaps impossible to implement.

In other words, the current Undergraduate Affairs Coordinator in the department feels that the University does not provide the tools to implement a program assessment of the kind the faculty of this department have elected to create.

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ Measure: Testing

Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The results of the 2014-2015 assessment cycle for our "Interconnectedness" program outcome show subject mastery for students who have completed the courses which map to this outcome. As both of these core courses (ENVI110 and ENVI130) focus on the interdisciplinary nature of Environmental Science, and are required for all our majors, we assess these goals using a test instrument measured at various stages during the degree program. In every case the students who completed both core courses (9 students are in this category) scored higher on the assessment post-test than the pre-test, with an increased average score of 27%.

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Recommendations : Response on the instrument continues to be low, despite significant effort to engage majors. During this assessment cycle, we employed the assistance of University

College advisors to encourage students to take pre-core assessment instruments, and department advisors to encourage students to take post-core assessment instruments. Another recommendation would be to roll out the pre-test instrument into our ENVI110 and ENVI130 sections to guarantee pre-test capture, and to make the post-test instrument part of ENVI460 (our majors' culminating experience course).

Reflections/Notes : Two significant hurdles stand in the way of effective assessment, and neither are in control of the Department of Earth & Environmental Systems. First, since first- and second-year advising is now the purview of the University College, the Department has very little initial contact with first-year majors, making it tough to get them to take the assessment pre-test. The Undergraduate Assessment Coordinator has asked the University College advisors to remind first-year majors to take the test, but it is hard to mandate they do so. The second major hurdle relates to this issue. There is no way to mandate students complete an assessment. The departmental Undergraduate Assessment Coordinator has contacted the University Assessment center to ask about this and was redirected to the registrar. The registrar indicated that such a hold (one before registration for second-semester freshman year, and another before graduation checkout) would be very difficult, or perhaps impossible to implement.

In other words, the current Undergraduate Affairs Coordinator in the department feels that the University does not provide the tools to implement a program assessment of the kind the faculty of this department have elected to create.

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ Measure: Projects

Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

No Findings Added

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ Measure: Projects

Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

Summary of Findings: The instructor of Spring 2015 ENVI460 sections certified that of the all EES majors who enrolled in ENVI460, completed the communication outcome of our assessment plan. Given that all ENVI 460 students must collect, interpret, and analyze original data as part of their personal and group research projects in this class, and that they also have to present their research orally and as a written report. the target achievement was met. They are given the opportunity to present their work as a poster presentation at Earth Day as well.

Results: Target Achievement: Met

Recommendations : Continue with the ENVI460 culminating experience as is.

Reflections/Notes :

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ Measure: Course outcomes & Exit Exam Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the five respondents to this assessment, four passed, and 3 of those 4 exceeded expectations

Results: Target Achievement: Met

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an Understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

▼ Measure: Course outcomes & Exit Exam Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the five respondents to this assessment, four met expectations, and 3 exceeded expectations.

Results: Target Achievement: Exceeded

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: This item was not assessed for the 2014-2015 Assessment Cycle, but may be assessed during the 2015-2016 Assessment Cycle.

[Note: for the 2015-2016 assessment cycle we have not yet decided which program assessment items to focus efforts on adding to our program assessment]

Results: Target Achievement: Met

Recommendations :

Reflections/Notes :

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing

BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the five respondents to this assessment, four met or exceeded expectations.

Results: Target Achievement: Exceeded

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

Summary of Findings: The Geosciences faculty evaluated graduating seniors by comparing BA/BS in Earth & Environmental Sciences majors' results on a more involved and major-specific pre-test and post-test assessment instrument. For the five respondents to this assessment, four met or exceeded expectations.

Results: Target Achievement: Exceeded

Recommendations : The major-specific involved pre- and post-tests should continue to be administered and results disseminated to the Undergraduate Assessment Coordinator and the Undergraduate Affairs Committee.

Reflections/Notes :

Overall Recommendations

Overall recommendations are to continue to collect assessment data to evaluate our major core, and to expand the assessment data collection beyond the items assessed for the 2015-2016 Cycle.

Another recommendation would be to work to enhance response rate for the core assessment for the 2015-2016 cycle. This will involve greater collaboration between advisors, the advisors of the University College, and the Department of Earth & Environmental Systems Undergraduate Affairs Committee Chairperson.

We may want to re-think our assessment plan given that it is overly complex when compared with those of our fellow science departments. One problem is that EES does not have a "subject area" test offered by ETS as other science departments do. This means we have to create and administer our own instruments.

Overall Reflection

Ultimately, the initial major core-focused assessment effort we attempted this year does appear to indicate that all responding students do appear to show learning gains when completing both courses of the common core, achieving higher scores on the assessment instrument than students who had not yet completed the core courses.

The core assessment as implemented for this assessment cycle had some shortcomings, chief of which continues to be response rate. This will need to be addressed by closer work with the Undergraduate Affairs Committee Chairperson and the concentration advisors, although two hurdles stand in the way: (1) University College advisors now have more contact with our first-year students in an advisory capacity than departmental advisors do, and (2) there is no way to require response formally to these assessment efforts, hurting response rate. The first hurdle is less of an issue with some of our ongoing connections with the UC advisors. The second hurdle is unavoidable and related to a lack of interest at the Institution in enabling assessment plans like ours to be implemented.

For the 2015-2016 Assessment Cycle we will need to continue to implement our assessment plan, expanding to collect data and complete assessments for our other program outcomes.

📄 Action Plan

Actions

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core and culminating experience courses, and to expand the assessment data collection to include multiple concentration items for the 2015-2016 Cycle. We will also consider changing when students are given pre- and post-assessment tests, but this is difficult given the lack of new-major contact due to University College Advising.

Another recommendation would be to continue work to enhance response rate for the core assessment. This will involve greater collaboration between University College advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel: The only personnel responsible for significant assessment activities in EES are Stephen Aldrich and Sandra Brake.

Measures:

Resource Allocations:

Priority:

📄 Status Report

Action Statuses

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core and culminating experience courses, and to expand the assessment data collection

to include multiple concentration items for the 2015-2016 Cycle. We will also consider changing when students are given pre- and post-assessment tests, but this is difficult given the lack of new-major contact due to University College Advising.

Another recommendation would be to continue work to enhance response rate for the core assessment. This will involve greater collaboration between University College advisors and the Undergraduate Affairs Committee Chairperson.

Implementation Plan (timeline):

Key/Responsible Personnel: The only personnel responsible for significant assessment activities in EES are Stephen Aldrich and Sandra Brake.

Measures:

Resource Allocations:

Priority:

Status for Recommendations

Current Status: Completed

Resource Allocation(s) Status:

Next Steps/Additional Information: We plan to implement our core assessment instrument in a course that brings our first year students together (which is part of our Student Success Plan). This should help us boost core assessment response rates.

Status Summary

No text specified

Summary of Next Steps

No text specified



2015-2016 Assessment Cycle

Assessment Plan

Outcomes and Measures

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

Implementation Plan (timeline): Pre-tests will be analyzed annually by Undergraduate Affairs committee in the first half of the Spring semester. Post-tests will be analyzed annually by the same committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

Target:

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Responsible Individual(s): Concentration Advisors

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Communication (core)

Effectively synthesize and communicate research findings both orally and in writing

Communication

Demonstrate the ability to effectively synthesize and communicate research findings both orally and in writing

▼ **Measure:** Projects
Direct - Other

Details/Description: Instructor of ENVI460 will assess student projects for data collection, analysis, and interpretation and provide information on the above to the Undergraduate Affairs Committee.

Target:

Implementation Plan (timeline): ENVI460 is offered in the spring semester. Projects will be collected and evaluated by the ENVI460 instructor and the evaluation forwarded to the Undergraduate Affairs committee chair before the following fall semester.

Responsible Individual(s): ENVI 460 Instructor

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

geological processes

Demonstrate an understanding of how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

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Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

Atmospheric and Surface Processes

Demonstrate knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

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Target:

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committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

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Responsible Individual(s): Undergraduate Affairs Committee

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Responsible Individual(s): Concentration Advisors

Assessment Findings

Finding per Measure

BA/BS in Earth & Environmental Sciences Outcome Set

Interdisciplinary (core)

Understand that environmental issues are fundamentally interdisciplinary

Interdisciplinary

Demonstrate an understanding that environmental issues are fundamentally interdisciplinary

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Direct - Exam

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Target:

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Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Physical and Cultural Interconnectedness (core)

Understand the interconnectedness of ecological systems to the physical and cultural world

Interconnectedness

Demonstrate an understanding of the interconnectedness of ecological systems to the physical and cultural world

▼ **Measure:** Testing
Direct - Exam

Details/Description: Pre-test will be administered at first advisor meeting upon declaration as a major. Post-test will be administered at student's convenience in the semester of graduation.

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Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Data Analysis (core)

Understand how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

Data Analysis

Demonstrate an understanding of how to collect, analyze, interpret, qualitative and quantitative data collected in the field and laboratory

▼ **Measure:** Projects
Direct - Other

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Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

No Findings Added

Communication (core)

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Responsible Individual(s): ENVI 460 Instructor

Findings for Projects

No Findings Added

Concepts

Comprehension of earth and environmental science principles, facts, and concepts

concepts

Demonstrate comprehension of earth and environmental science principles, facts, and concepts

▼ **Measure:** Course outcomes & Exit Exam
Direct - Exam

Details/Description: Faculty will evaluate course outcomes and results of exit exam.

Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

No Findings Added

Geological Processes (geosciences concentration)

Understand how to identify, describe, and classify earth materials, formation, and structures, and interpret them in the context of geologic processes

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Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

No Findings Added

Atmospheric and Surface Processes (A&SP concentration)

Gain knowledge of the intricacies of the hydrologic cycle and its influence on the land and atmosphere

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committee in the first half of the Fall semester.

Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Synthesize geologic history (geosciences concentration)

Synthesize the geologic history of Earth as evidenced by the rock record

Synthesize geologic history

Demonstrate ability to synthesize the geologic history of Earth as evidenced by the rock record

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Target:

Implementation Plan (timeline): Each fall faculty will provide the Undergraduate Affairs Committee with summary grades and exit exams for the previous year.

Responsible Individual(s): Undergraduate Affairs Committee

Findings for Course outcomes & Exit Exam

No Findings Added

Spatio-temporal analysis (A&SP concentration)

Employ spatio-temporal analysis to interpret earth-atmosphere interactions

spatio-temporal analysis

Demonstrate ability to employ spatio-temporal analysis to interpret earth-atmosphere interactions

▼ **Measure:** Testing
Direct - Exam

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Target:

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Responsible Individual(s): Concentration Advisors

Findings for Testing

No Findings Added

Overall Recommendations

No text specified

Overall Reflection

No text specified

Action Plan

Actions

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Action Details: Overall recommendations are to continue to collect assessment data to evaluate our major core and culminating experience courses, and to expand the assessment data collection to include multiple concentration items for the 2016-2017 Cycle.

One thing the Undergraduate Affairs Committee may consider this year is whether major revisions to our Assessment plan are warranted.

Implementation Plan (timeline):

Key/Responsible Personnel: The only personnel responsible for significant assessment activities in EES are Stephen Aldrich and Sandra Brake.

Measures:

Resource Allocations:

Priority:

Status Report

Action Statuses

Action Plan

Outcome

Action Plan

▼ Action: Recommendations

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Measures:

Resource Allocations:

Priority:

Status for Recommendations

No Status Added

Status Summary

No text specified

Summary of Next Steps

No text specified

2016-2017 Assessment Cycle

 **Assessment Plan**

 **Assessment Findings**

 **Action Plan**

 **Status Report**

2017-2018 Assessment Cycle

 **Assessment Plan**

 **Assessment Findings**

 **Action Plan**

 **Status Report**

2018-2019 Assessment Cycle

 **Assessment Plan**

 **Assessment Findings**

 **Action Plan**

 **Status Report**

2019-2020 Assessment Cycle

 **Assessment Plan**

 **Assessment Findings**

 **Action Plan**

 **Status Report**

Appendix

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- A. **Geology** (Adobe Acrobat Document)
 - B. **Geology** (Adobe Acrobat Document)
 - C. **Earth & Environmental Sciences** (Curriculum Map)
-