

Course Student Learning Outcomes Assessment

BIOL 259 Environmental Biology

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General Information (Course Student Learning Outcomes Assessment)

Standing Requirements

📖 Course Description

Introduction to Environmental Biology includes study of ecosystems population dynamics classification diversity of plant and animal species effects of pollutants at both the cellular and organismal levels and principles of ecology.

📖 Course Student Learning Outcomes

BIOL 259 Environmental Biology Outcome Set

Outcome	
Outcome	Mapping
Outcome 1 Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.	Institutional Student Learning Outcomes: Act 3, Communicate 1, Communicate 3, Learn 1, Think 1, Think 2, Think 3
Outcome 2 Express a fundamental comprehension of ecological principles by citing examples.	Institutional Student Learning Outcomes: Act 3, Communicate 1, Communicate 3, Learn 1, Think 1, Think 2, Think 3
Outcome 3 Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.	Institutional Student Learning Outcomes: Act 3, Communicate 1, Communicate 3, Learn 1, Think 1, Think 2

2014-2015 Assessment Cycle

Measurements

Outcomes and Measures

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool: Various multiple choice questions will be placed into lecture exams.

Criteria for Success: Individual & Collective Student Criterion: 70% of the students, on average, should be able to answer the questions correctly.

Cycle of Assessment: Fall 2014

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool: Various multiple choice questions will be placed into lecture exams.

Criteria for Success: Individual & Collective Student Criterion: 70% of the students, on average, should be able to answer the questions correctly.

Cycle of Assessment: Fall 2015

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool: One 10-point essay question the first laboratory exam. A rubric was generated to assess this question.

Explain, in detail the two methods we used in lab to estimate the population size of organisms without counting each individual. Make sure to fully explain, using diagrams if applicable, both methods and how you used them.

- 10 – Identifies and fully explains both sampling methods
- 7 – Identifies both sampling methods, but does not give sufficient details
- 5 – Identifies and fully explains one method but not the other
- 3 – Identifies both methods but gives no explanation OR identifies one method but lacks sufficient details
- 1 – Identifies one method but gives no explanation
- 0 – Does not identify either method correctly

Criteria for Success: Individual & Collective Student Criterion: I would expect over 51% of the students to get a 7 or greater on the question, 70% to get 5 or greater, 80% to get 3 or greater.

Cycle of Assessment: Fall 2016

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings

Finding per Measure

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ Measure: Means of assessment 259 Course level; Direct - Exam

Description of Measurement Tool: Various multiple choice questions will be placed into lecture exams.

Criteria for Success: Individual & Collective Student Criterion: 70% of the students, on average, should be able to answer the questions correctly.

Cycle of Assessment: Fall 2014

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings for Means of assessment 259

Summary of Findings: Question #1: In a tide pool, 15 species of invertebrates were reduced to eight after one species was removed. The species removed was likely a(n)

- A. community facilitator.
- B. keystone species.
- C. herbivore.
- D. resource partitioner.
- E. optimal forager.

86.7% answered this question correctly (n=26)

Question #2: The following number of ant species were counted in these biomes.

Tundra (5), Taiga (18), Coniferous Forest (41), Tropical Rain Forest (10)

The most likely reason(s) for the number of ant species in this list is/are:

- A) greater sunlight.
- B) variations in soil type.
- C) different species of predators.
- D) air pressure, humidity, and resulting rainfall.
- E) the amount of photosynthetic production, length of the warm season, and diversity of plants.

70.4% answered this question correctly (n=27)

Question #3: Cholera, dysentery and typhoid fever outbreaks, along with massive fish kills are related to which of the following being present in water supplies?

- A. raw sewage
- B. algae
- C. fertilizers
- D. herbicides
- E. food additives

55.6% answered this question correctly (n=27)

Results: Criteria for Success Achievement Status: Met

Analysis of Findings: Although the correct results from question #3 are lower than expected, the overall average for success is 70%, meeting the benchmark.

Recommendations:

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool: Various multiple choice questions will be placed into lecture exams.

Criteria for Success: Individual & Collective Student Criterion: 70% of the students, on average, should be able to answer the questions correctly.

Cycle of Assessment: Fall 2015

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings for Means of assessment 259

No Findings Added

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool: One 10-point essay question the first laboratory exam. A rubric was generated to assess this question.

Explain, in detail the two methods we used in lab to estimate the population size of organisms without counting each individual. Make sure to fully explain, using diagrams if applicable, both methods and how you used them.

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- 0 – Does not identify either method correctly

Criteria for Success: Individual & Collective Student Criterion: I would expect over 51% of the students to get a 7 or greater on the question, 70% to get 5 or greater, 80% to get 3 or greater.

Cycle of Assessment: Fall 2016

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings for Means of assessment 259

No Findings Added

Overall Recommendations

No text specified

 **Plans of Action**

 **Status Reports**

2013-2014 Assessment Cycle

Measurements

Outcomes and Measures

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool:

Criteria for Success: Individual & Collective Student Criterion:

Cycle of Assessment: Fall 2014

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool:

Criteria for Success: Individual & Collective Student Criterion:

Cycle of Assessment: Fall 2015

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

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Cycle of Assessment: Fall 2013

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

 Findings

Finding per Measure

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool:

Criteria for Success: Individual & Collective Student Criterion:

Cycle of Assessment: Fall 2014

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings for Means of assessment 259

Summary of Findings: Question #1: In a tide pool, 15 species of invertebrates were reduced to eight after one species was removed. The species removed was likely a(n)

- A. community facilitator.
- B. keystone species.
- C. herbivore.
- D. resource partitioner.
- E. optimal forager.

86.7% answered this question correctly (n=26)

Question #2: The following number of ant species were counted in these biomes. Tundra (5), Taiga (18), Coniferous Forest (41), Tropical Rain Forest (10)

The most likely reason(s) for the number of ant species in this list is/are:

- A) greater sunlight.
- B) variations in soil type.
- C) different species of predators.
- D) air pressure, humidity, and resulting rainfall.
- E) the amount of photosynthetic production, length of the warm season, and diversity of plants.

70.4% answered this question correctly (n=27)

Question #3: Cholera, dysentery and typhoid fever outbreaks, along with massive fish kills are related to which of the following being present in water supplies?

- A. raw sewage
- B. algae
- C. fertilizers
- D. herbicides
- E. food additives

55.6% answered this question correctly (n=27)

Results: Criteria for Success Achievement Status: Met

Analysis of Findings: Although the correct results from question #3 are lower than expected, the overall average for success is 70%, meeting the benchmark.

Recommendations:

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool:

Criteria for Success: Individual & Collective Student Criterion:

Cycle of Assessment: Fall 2015

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings for Means of assessment 259

No Findings Added

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Measure:** Means of assessment 259
Course level; Direct - Exam

Description of Measurement Tool: One 10-point essay question the first laboratory exam. A rubric was generated to assess this question.

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- 1 – Identifies one method but gives no explanation
- 0 – Does not identify either method correctly

Criteria for Success: Individual & Collective Student Criterion: I would expect over 51% of the students to get a 7 or greater on the question, 70% to get 5 or greater, 80% to get 3 or greater.

Cycle of Assessment: Fall 2013

Who is Responsible for Assessment Activity?: Biology faculty currently teaching the course.

Findings for Means of assessment 259

Summary of Findings: 31 students were sampled, below is the distribution of scores:

- 10 points – 6/31 (19.4%)
- 7 points – 8/31 (25.8%)
- 5 points – 4/31 (12.9%)
- 3 points – 8/31 (25.8%)
- 1 points – 3/31 (9.7%)
- 0 points – 2/31 (6.4%)

Results: Criteria for Success Achievement Status: Not Met

Analysis of Findings: Almost 45% of the students received a 7 or greater on the question, 58% received 5 or more points on the question, and 42% of the class received 3 or less.

The results are all across the board here. I would expect a majority of the students to be around the 7-point range, meaning they should be able to describe both methods, but maybe not completely. This topic was something I covered in class and asked them to be familiar with on a study guide. The large percentage of students below 5 points troubles me. My first thought is that they just are not studying for the exam.

Recommendations: This is the first assessment of this SLO, I need more data before I make any decision as for what to do next.

Overall Recommendations

No text specified

Plans of Action

Actions

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

No actions specified

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

No actions specified

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ Action: Plan of action 259 SLO #3

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Details of Plan of Action: This is the first assessment of this SLO, I need more data before I make any decision as for what to do next.

Plan of Action Timeline: Repeat assessment Fall 2016

Who is responsible for carrying out the Plan of Action?: Biology faculty currently teaching the course.

How will you determine if the Plan of Action has been effective?: If students meet or exceed the expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Status Reports

Action Statuses

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

No actions specified

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

No actions specified

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Action:** Plan of action 259 SLO #3

Details of Plan of Action: This is the first assessment of this SLO, I need more data before I make any decision as for what to do next.

Plan of Action Timeline: Repeat assessment Fall 2016

Who is responsible for carrying out the Plan of Action?: Biology faculty currently teaching the course.

How will you determine if the Plan of Action has been effective?: If students meet or exceed the expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Status for Plan of action 259 SLO #3

No Status Added

Status Summary

No text specified

Summary of Next Steps

No text specified

2012-2013 Assessment Cycle

Measurements

Outcomes and Measures

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ **Measure:** Means of assessment Fall 2011
Course level; Direct - Exam

Description of Measurement Tool: 3 short answer questions on the practical exam

Criteria for Success: Individual & Collective Student Criterion: 65% correct expected for C question, 20% correct for B question and 10% correct for A question

Cycle of Assessment: Fall 2011

Who is Responsible for Assessment Activity?: Mike Taylor

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Measure:** Means of assessment Fall 2012
Course level; Direct - Exam

Description of Measurement Tool: 3 multiple choice questions on the lecture exam.

Criteria for Success: Individual & Collective Student Criterion: 65% correct expected for C question, 20% correct for B question and 10% correct for A question.

Cycle of Assessment: Fall 2012

Who is Responsible for Assessment Activity?: Mike Taylor

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Measure:** Means of assessment Fall 2013
Course level; Direct - Exam

Description of Measurement Tool: Students will answer a question on a laboratory exam where they are to analyze a set of given data, graph the results, and draw conclusions.

Criteria for Success: Individual & Collective Student Criterion: Expected 70% success rate.

Cycle of Assessment: Fall 2013

Who is Responsible for Assessment Activity?: Mike Taylor

Findings

Finding per Measure

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ **Measure:** Means of assessment Fall 2011

Course level; Direct - Exam

Description of Measurement Tool: 3 short answer questions on the practical exam

Criteria for Success: Individual & Collective Student Criterion: 65% correct expected for C question, 20% correct for B question and 10% correct for A question

Cycle of Assessment: Fall 2011

Who is Responsible for Assessment Activity?: Mike Taylor

Findings for Means of assessment Fall 2011

Summary of Findings:

1. _____ environmental changes, which are common to all plant succession, are brought about by the actions of organisms.

A) Autogenic B) Autozygous C) Allogenic D) Allopatric

8/28 (28.3%)

2. The following number of ant species were counted in these biomes.

Tundra (5)

Taiga (18)

Coniferous Forest (41)

Tropical Rain Forest (10)

The most likely reason(s) for the number of ant species in this list is/are:

A) greater sunlight. B) variations in soil type. C) different species of predators. D) air pressure, humidity, and resulting rainfall. E) the amount of photosynthetic production, length of the warm season, and diversity of plants

19/28 (67.9%)

3. An ecosystem contains A) only the biotic components of the environment. B) only the abiotic components of the environment. C) only the energy flow components of an environment. D) both the living organisms and the abiotic components of the environment. E) only the food relationships found in an environment.

28/31 (85.7%)

Results: Criteria for Success Achievement Status: Met

Analysis of Findings: I used the same three questions that I did in the Fall 2009 assessment but the results are very different. Last time I thought the questions might be too easy and did not reflect the criteria stated in column 2. Now the numbers do fit the criteria better.

Recommendations:

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Measure:** Means of assessment Fall 2012

Course level; Direct - Exam

Description of Measurement Tool: 3 multiple choice questions on the lecture exam.

Criteria for Success: Individual & Collective Student Criterion: 65% correct expected for C question, 20% correct for B question and 10% correct for A question.

Cycle of Assessment: Fall 2012

Who is Responsible for Assessment Activity?: Mike Taylor

Findings for Means of assessment Fall 2012

Summary of Findings: 1. Consider the life of the praying mantis. The large predatory female lays several hundred eggs in a foam mass in the fall. The young are most vulnerable when they emerge in the spring, but the few that survive spread out over the countryside and, if they find a mate, lay eggs the following fall. Which type of survivorship curve does this represent? A) type I B) type II C) type III D) exponential growth followed by a decline from resource depletion E) maximal exponential growth and minimal use of carrying capacity

18/30 (60%)

2. Which of the following is the least likely outcome of a host-parasite interaction? A) The host population evolves to become more susceptible to the parasite. B) The parasite population evolves better means of avoiding host defenses. C) The parasitism evolves into mutualism. D) The host population evolves stronger defenses against the parasite.

11/29 (38%)

3. In a predator-prey cycle A) a decline in the numbers of predators causes a decline in the number of prey. B) a decline in the numbers of prey causes a decline in the number of predators C) an increase in the number of predators triggers an increase in the number of prey. D) All of the choices are correct, causing an up-and-down cycle for each animal. E) None of the choices are correct since this is a seasonal die-off that would occur without the other species present.

26/29 (90%)

Results: Criteria for Success Achievement Status: Met

Analysis of Findings: Question #1 had an increase of 12% from the last assessment, question #2 had an increase of 7% from the last assessment and question #3 had an increase of 35% since the last assessment.

Recommendations:

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Measure:** Means of assessment Fall 2013
Course level; Direct - Exam

Description of Measurement Tool: Students will answer a question on a laboratory exam where they are to analyze a set of given data, graph the results, and draw conclusions.

Criteria for Success: Individual & Collective Student Criterion: Expected 70% success rate.

Cycle of Assessment: Fall 2013

Who is Responsible for Assessment Activity?: Mike Taylor

Findings for Means of assessment Fall 2013

Summary of Findings: The question the students are to answer is worth 15 points and those points are split over analysis, graphing, and conclusions.

Results: Criteria for Success Achievement Status: Met

Analysis of Findings: The average score for the question was 11.7 (77.3%).

Recommendations:

Overall Recommendations

No text specified

 Plans of Action

Actions

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ **Action:** Means of assessment Fall 2011

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Details of Plan of Action: Since I got very different results this time I will use these questions once again to see where a third assessment will lie compared to the first two times through.

Plan of Action Timeline: Assess again Fall 2014

Who is responsible for carrying out the Plan of Action?: Mike Taylor

How will you determine if the Plan of Action has been effective?: If students meet the expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Outcome 2

Express a fundamental comprehension of ecological principles by citing examples.

▼ **Action:** Means of assessment Fall 2012

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Details of Plan of Action: Since I have had an increase in the percentage of correct answers I will keep the same questions for the next assessment and see if they remain the same, increase again, or decrease.

Plan of Action Timeline: Repeat assessment Fall 2015

Who is responsible for carrying out the Plan of Action?: Mike Taylor

How will you determine if the Plan of Action has been effective?: If students meet expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid

▼ **Action:** Means of assessment Fall 2013

This Action is associated with the following Findings

No supporting Findings have been linked to this Action.

Details of Plan of Action: I have many lab assignments that have the students graph the data they collect. I do have a short presentation on proper graphing techniques so maybe I need a long,

conclusions based on the results.

more detailed presentation. I will continue to use this question on future exams and will evaluate success each semester.

Plan of Action Timeline: Repeat assessment Fall 2016

Who is responsible for carrying out the Plan of Action?: Mike Taylor

How will you determine if the Plan of Action has been effective?: If students meet expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

📄 Status Reports

Action Statuses

BIOL 259 Environmental Biology Outcome Set

Outcome

Outcome 1

Demonstrate a cohesive understanding of the relationship between ecosystems, populations, and pollutants.

▼ Action: Means of assessment Fall 2011

Details of Plan of Action: Since I got very different results this time I will use these questions once again to see where a third assessment will lie compared to the first two times through.

Plan of Action Timeline: Assess again Fall 2014

Who is responsible for carrying out the Plan of Action?: Mike Taylor

How will you determine if the Plan of Action has been effective?: If students meet the expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Status for Means of assessment Fall 2011

Current Status: Not started

Budget Status: Other

Explanation of current status:

Has the Plan of Action been effective? What are the next steps?:

Outcome 2

Express a fundamental

▼ Action: Means of assessment Fall 2012

comprehension of ecological principles by citing examples.

Details of Plan of Action: Since I have had an increase in the percentage of correct answers I will keep the same questions for the next assessment and see if they remain the same, increase again, or decrease.

Plan of Action Timeline: Repeat assessment Fall 2015

Who is responsible for carrying out the Plan of Action?: Mike Taylor

How will you determine if the Plan of Action has been effective?: If students meet expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Status for Means of assessment Fall 2012

Current Status: Not started

Budget Status: Other

Explanation of current status:

Has the Plan of Action been effective? What are the next steps?:

Outcome 3

Conduct laboratory investigations according to given experimental procedure, collect and analyze resulting experimental data, and formulate valid conclusions based on the results.

▼ **Action:** Means of assessment Fall 2013

Details of Plan of Action: I have many lab assignments that have the students graph the data they collect. I do have a short presentation on proper graphing techniques so maybe I need a long, more detailed presentation. I will continue to use this question on future exams and will evaluate success each semester.

Plan of Action Timeline: Repeat assessment Fall 2016

Who is responsible for carrying out the Plan of Action?: Mike Taylor

How will you determine if the Plan of Action has been effective?: If students meet expectation.

Additional Resources Required (if any):

Budget request amount: \$0.00

Priority: Low

Status for Means of assessment Fall 2013

Current Status: Not started

Budget Status: Other

Explanation of current status:

Has the Plan of Action been effective? What are the next steps?:

Status Summary

No text specified

Summary of Next Steps

No text specified