



presentations based on clarity, organization, answering questions, etc...Attendance for all presentations is mandatory and failure to do so will result in a grade reduction.

Learning outcome #4 was assessed with the following rubric. The first three rows assessed the written document and the last 2 assessed the oral presentation.

**Assessment Rubric learning outcome #4:** Effectively communicate the results of environmental studies to other scientists, decision makers and the general public.

	Unsatisfactory	Developing	Satisfactory	Exemplary
topic is thoroughly researched and properly cited	topic is inadequately researched (fewer than 3 sources) and/or cited	topic is somewhat researched (3-4 sources)	topic is adequately researched (5-7 sources) and well cited	topic is thoroughly researched from multiple sources (8 or more) and is well cited
paper is well organized and well written with correct grammar and spelling	paper not organized; many grammar/spelling errors per page	paper somewhat organized with 3 or more grammar/spelling errors per page	paper is adequately organized with 1-2 grammar/spelling errors per page	paper is well organized with fewer than 1 grammar/spelling error per page
tables and figures are used to illustrate concepts	No tables or figures are provided	One figure or table is given	Tables and figures illustrate some concepts	Tables and figures completely support the text
oral presentation describes project and outcomes/summarizes paper (problem statement, lit review, analysis of solutions, recommendations)	presentation fails to describe project	presentation gives acceptable summary, but fails to include several components	presentation gives adequate summary of paper with most topics included	presentation gives excellent summary of paper, including problem statement, lit review, analysis of solutions, and recommendations
oral presentation is well presented and demonstrates knowledge of topic	presenter shows minimal knowledge of topic; presentation poorly organized	presenter shows some knowledge of topic; presentation somewhat organized	presenter demonstrates adequate knowledge; presentation acceptably organized	presenter demonstrates in depth knowledge of topic; presentation well organized

The table below summarizes the percentage and (number) of students who met the outcome at each level:

n = 15 students	Unsatisfactory	Developing	Satisfactory	Exemplary
topic is thoroughly researched and properly cited	0 (0)	0 (0)	0 (0)	100% (15)
paper is well organized and well written with correct grammar and spelling	0 (0)	6.7% (1)	13.3% (2)	80% (12)
tables and figures are used to illustrate concepts	26.6% (4)	20% (3)	13.3% (2)	40% (6)
oral presentation describes project and outcomes/summarizes paper (problem statement, lit review, analysis of solutions, recommendations)	0 (0)	0 (0)	20% (3)	80% (12)
oral presentation is well presented and demonstrates knowledge of topic	0 (0)	0 (0)	33.3% (5)	66.7% (10)

**Continuous improvement:**

Not all students' reports included tables and graphs and according to this rubric, they were graded down. In retrospect, some of the reports did not need tables or graphs, or at least needed only one or two, to illustrate concepts. Next year, this rubric will be edited to state, "tables and figures are used to illustrate concepts when appropriate." There will be an added assessment row for the oral presentation to reflect how well students remained within the time limit.

**Learning outcome #5 was assessed with the following rubric:**

**Assessment Rubric for learning outcome #5:** The ability to think creatively and to identify potential solutions to current and emerging problems, and to evaluate the technical and economic feasibility of such solutions.

	Unsatisfactory	Developing	Satisfactory	Exemplary
Describes the challenge and how climate change effects it	Fails to define challenge or climate change effects	Gives little information about challenge and climate change effects	describes challenge and effect of climate change from one perspective	Thoroughly describes challenge and how it is affected by climate change from multiple perspectives
assess the challenge in terms of sustainability (environmental, social, and/or economic)	Fails to assess in terms of sustainability	assess in terms of only one aspect of sustainability	Assess in terms of at least two aspects of sustainability	Thoroughly assesses in terms of sustainability from environmental, social, and economic perspectives
provide a comprehensive literature review of the challenge and identify proposed solutions	provides a minimal literature review of the topic	provides a brief literature review and identifies one solution	provides an adequate literature review with one or two proposed solutions	provides a comprehensive literature review including multiple possible solutions
creatively analyze potential solutions from an environmental, economic, and social perspective	Fails to analyze solutions	Analyze single solution from at least two perspectives	Analyzes solutions from two perspectives	Thoroughly analyzes multiple solutions from economic, social, and environmental perspectives
make recommendations based on analysis	Makes no recommendation	Makes a recommendation from multiple perspectives, but does not consider feasibility	Makes a recommendation based on creative analysis and feasibility from two perspectives	Makes a recommendation based on creative analysis and feasibility from environmental, social, economic perspective

The table below summarizes the percentage and (number) of students who met the outcome at each level:

n = 15 students	Unsatisfactory	Developing	Satisfactory	Exemplary
Describes the challenge and how climate change effects it	0 (0)	0 (0)	46.7% (7)	53.3% (8)
assess the challenge in terms of sustainability (environmental, social, and/or economic)	0 (0)	0 (0)	20% (3)	80% (12)
provide a comprehensive literature review of the challenge and identify proposed solutions	0 (0)	0 (0)	26.7% (4)	73.3% (11)
creatively analyze potential solutions from an environmental, economic, and social perspective	0 (0)	0 (0)	40% (6)	60% (9)
make recommendations based on analysis	0 (0)	0 (0)	26.7% (4)	73.3% (11)

**Continuous improvement:**

Based on student feedback from course evaluations and an in-class discussion, the projects next year will be required to include an international component in which the student will consider the implications of a local issue on the bigger global scale.