ENVIRONMENTAL STUDIES DEPARTMENT ASSESSMENT PROGRAM

Introduction and History

During the 2008-2009 academic year the Department of Environmental Studies (ES) came together to discuss the development and implementation of a department assessment program. In our department self-study as part of the 2006-2007 ES Department review we stated:

The assessment plan proposed in 1990, which revolved around the submission and review of an Individualized Learning Plan for each major has not been implemented to any significant degree. This may be partly due to the existence of only one core faculty member in the department and the turnover in Departmental leadership. The major effort at program assessment over the past two years has been the development of a report to the faculty on the case for Departmental status. This effort by the ES Coordinating Committee resulted in the collection of a good deal of data on the success and weaknesses of the program. The assessment plan for the upcoming five years will focus on the following:

1. *Review of major plans and transcripts of ES majors to identify the elective courses and second majors (or six course focus) that have most often been chosen by ES majors to see if the course selection patterns reflect the goals of the Department.*

2. *Review of syllabi in courses most often taken by ES majors to assess the extent to which the goals of the overall program are furthered by the material in these courses.*

3. *"Exit interviews" with ES majors to identify their perceptions regarding the strengths and weaknesses of the major and the extent to which the above goals have been met.*

4. *A survey of internship supervisors and sites that have been used by ES majors over the past 5 years to see how the performance of these interns has been evaluated.*

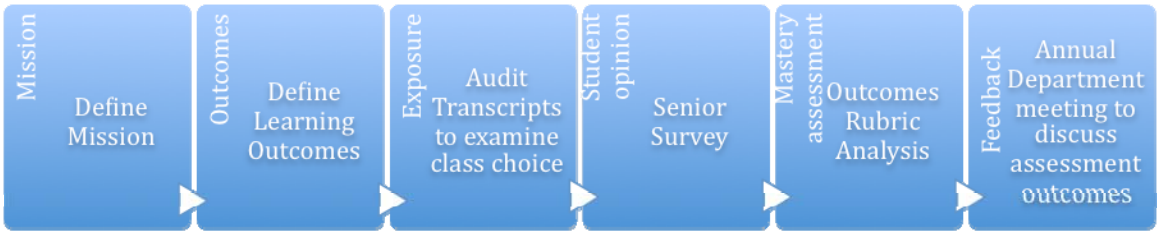
5. *A survey of ES grads over the past five years to get information regarding evaluation of the program and the career and citizenship paths of the relatively recent graduates.*

6. *An annual spring daylong retreat by the Environmental Studies Coordinating Committee to review assessment materials and to discuss the status of the Department and its improvement. A similar end of year event should be planned for majors to collect information and facilitate communication.*

During 2007-2008 we focused our efforts on recruiting a new position to the ES department (a climate scientist) and did little to implement this new plan. In 2008-2009 we met with Nancy Bostrom, the campus assessment facilitator and began a conversation about developing a new assessment program that we would begin to implement in 2009. This document provides our new six-step assessment plan. The first annual report (2009) on the implementation of this plan will be forthcoming.

Assessment Outline

The Macalester College Environmental Studies Department Assessment Program consists of the following six steps:



As part of our decennial department review in 2006-2007, the ES department reviewed its mission statement and learning outcomes for students. We plan to revisit the mission statement and learning outcomes when we conduct our self-study for the next department review. The remaining four steps of our assessement program (transcript audit, senior survey, outcomes rubric analysis, department meeting to discsuss the assessment outcomes) will be conducted on an annual basis.

A fuller description of the assessment program is given below.

1. Define Mission

The ES Program's mission as stated in the College Catalogue is as follows:

"Environmental Studies is an interdisciplinary program based on a holistic understanding of environmental issues occurring at the local, national, and global level. The program educates students using the tools and perspectives of the humanities, natural sciences, and social sciences to understand the causes and consequences of environmental problems and the knowledge to develop solutions."

The current major requires three explicitly integrative courses (Environmental Classics, Environmental Leadership Practicum and the Senior Seminar). The purpose of these courses is to blend and combine multidisciplinary analyses and perspectives. In addition, elective courses are required from the divisions of natural sciences, social sciences, and humanities.

At Macalester, to insure exposure to disciplinary thinking and depth, the ES major requires a seven-course focus with one of the courses being a methods course. Thus, the ES program recognizes and builds on the importance of disciplinary training. In actuality, a significant percentage of our majors do acquire a second major. The application of disciplinary tools and methods to problems in the larger community is one of the principal missions of the program. Interdisciplinarity in this context means across disciplines, not without discipline

2. Define Learning Outcomes

When trying to assess the special nature of interdisciplinary programs, Rhoten *et al.* (2006)[1] suggest the following framework for assessing these programs.

"Analysis of interview transcripts and student work has given rise to an assessment framework that highlights four core dimensions of student interdisciplinary work: *Purpose, Disciplinary Grounding, Integration and Thoughtfulness* (Boix-Mansilla, 2005)[2]. Below are summary descriptions of each dimension.

Purpose
Interdisciplinary work is often geared toward describing or explaining phenomena or events that are multidimensional, solving complex problems, proposing new interpretations, creating products. The purpose of a piece of work or interdisciplinary exploration drives the crafting of the work – what disciplinary insights are relevant, which disciplines should dominate, how disciplines could be combined to leverage or advance the goals of the work, how to decide when the work is "done" and its purpose accomplished.

To assess this dimension of interdisciplinary work faculty begin by asking: What is the purpose of the work? Is the purpose of the work clear (whether explicit or implicit)? Does the purpose invite/require an interdisciplinary approach? How so?

Disciplinary Grounding
Interdisciplinary work builds on insights, findings, methods, techniques, languages, and modes of thinking in two or more disciplines or areas of expertise to accomplish its goals. This dimension examines the degree to which students have taken advantage of the disciplinary learning opportunities offered in the course to advance the purpose of their work.

We may ask which disciplines inform this work? Are disciplinary insights, methods, languages and values used in rich and effective ways? Consider each discipline involved (e.g. is this scientific concept accurate? It that artistic representation provocative?)

Integration
Interdisciplinary work invites students not only to use multiple disciplines but also to integrate them to accomplish the purpose of a piece of work. When disciplines are combined, new understandings are possible. For example, by integrating a new discipline like chemistry in a geography-based study of global climate change students come to *explain the phenomenon* (e.g. how Co2 traps heat in the

[1] Rhoten, D., V. Boix-Mansilla, M. Chun and J. Thompson-Klein. 2006. Interdisciplinary Education at Liberal Arts Institutions. Teagle White Paper.
[2] Boix-Mansilla, V. (2005). Assessing Student work at Disciplinary Crossroads. *Change*, 37 (January/February), 14–21.

atmosphere) in ways that they would not have been able to get at through geography alone. Memorializing – creating an aesthetic visual commentary (art) about a past event (history) – enables students to synthesize the significance of the event in an evocative metaphor, one that a non-artistic approach might have missed. Multiple disciplinary combinations can invite deeper and richer understandings.

We may therefore ask: What are the key points of integration proposed in the work (i.e., where are disciplinary perspectives clearly brought together in a phrase, metaphor, interpretation, or explanation)?
Are the integrations enabling students to advance their understanding effectively (e.g. to produce more comprehensive descriptions, multi-causal explanations, novel interpretations, or deeper explorations that benefit from the combination of perspectives)?

Thoughtfulness
Interdisciplinary work invites students' thoughtful engagement with their topics of study. Students weigh different aesthetic decisions to interpret a historical event, they consider competing explanations for social or natural phenomena, they strive for deeper, less obvious accounts of human experience. Thoughtfulness – the ability to consider choices, possibilities and challenges with care – characterizes the process of producing interdisciplinary work and is sometimes made explicit in its outcome.

Assessing this dimension of student work may involve considering the degree to which the student has reflected about the learning challenges and possibilities of bringing disciplinary insights together to address her purposes. Occasionally this dimension may call for additional pieces of evidence (e.g., a student reflection or a brief conversation) that makes students' thinking visible.

A productive use of the framework, Boix-Mansilla points out, demands a careful adaptation of each of its dimensions to the problems of study and disciplinary repertoires in a particular course or program. What are the disciplinary understandings that the course sought to develop? What should be the value added of bringing disciplinary lenses together? How might students exhibit critical awareness in this particular project? Questions of this kind enable instructors to tailor the framework to their content areas and in turn to take it into account as they establish the aims and processes of their instruction."

Repko[3] states, "These same four cognitive abilities, slightly modified, may be expressed as learning outcomes at the course level. For example, in an introductory course, students would be challenged to

[3] Repke, A.F. Assessing Interdisciplinary Learning Outcomes.
http://www.uta.edu/ints/faculty/repko.php

- view the course theme, issue, problem, or question from the perspective of two disciplines (i.e., use disciplinary-based [and conflicting] perspectives to better understand a problem)
- perceive connections between the two knowledge (i.e., disciplinary) domains that pertain to the course problem or theme
- integrate conflicting disciplinary insights and viewpoints
- produce a more comprehensive understanding of the course problem or theme and test it by proposing a holistic solution."

A working group at Oberlin in 2002, sponsored by an NSF-AIRE grant, discussed in great deal the competencies expected for majors in Environmental Studies. They stated in their report:

> *"First, what does 'competency' mean?*
> *A student is competent when he or she has achieved an expected level of mastery of some basic skill such as writing, speaking, or computer use. It can also mean that the individual has achieved enough understanding about a given issue, philosophical construct, or specific body of information (e.g., globalization, biological consequences of ozone depletion) to appreciate the importance of that issue, to know how much he or she doesn't know about it, and, if needed, know how to learn more about the issue. The desirability of fostering certain basic competencies is not exclusive to ES programs, but some of them (e.g., writing skills, public speaking) may be especially useful to graduates with this major."*

After discussing the issues of what "skills" ES students should have and what "competencies" they should have, the members of the workshop produced long lists of skills, competencies and knowledge areas that would be desirable for ES majors. After discussing these lists the workshop members concluded:

> *"A number of thoughts that bear mention came up during the discussions of core competencies, specifically:*
>
> *Capacity to integrate disparate information in order to consider complex problems is especially crucial for the ES major as is the related notion of 'system thinking', namely the ability to think systematically about complicated problems. The ES curriculum is indeed multidisciplinary to a large extent, and to master and apply its tools and information to solve problems requires these skills. The ES major/practitioner must be able to recognize and communicate with diverse kinds of specialists. They must understand the premises of diverse disciplines. They must also adequately appreciate the limitations of science as problem solver and the nature of scientific uncertainty and controversy (e.g., the difficulty of predicting specific consequences of a doubling of the concentration of CO2 in the Earth's atmosphere).*

Leadership skills are important, specifically, capacity for consensus building and appreciation of group dynamics and personality.

Problem solving is another inordinately important skill for ES—the ability to apply theory, "Applying competencies to problems is basic to ES".

The Humanities help us define human problems and our links to nature and each other and to appreciate the nature of our species, spirituality, aesthetics, and relationships and differences among cultures. Humanists teach us how to self examine, how to approach and analyze issues that concern values, moral dilemmas, and ethics. They teach us that we can't solve all problems with just science. They help us define our obligations to posterity.

ES is defined in part by its unique pedagogy—it calls for " interdisciplinary integration" a truly holistic approach to complex problems stemming from our need to use nature without inflicting undue damage to it.

Realistically, our list of core competencies is ideal, not readily achievable given the limited resources available to most ES programs, the time available to impart them to undergraduates, and the need to assure that ES majors also develop significant depth in some specific subject area(s).

The question remains how much skill/appreciation of a given tool/construct/body of information constitutes competence? Many of the conference participants reported that their courses, even their introductory ES courses, introduce students to most of the items listed above, but often only superficially. So the question of how much familiarity or skill equals competency remains open.

Some of the competencies that are especially desirable in the ES graduate are personal rather than academic, for example, healthy skepticism, affability, propensity to be a team player. To what extend can these traits be taught?"

Based on the results of this workshop and discussion among ES Department members at Macalester, we developed the following list of core competencies for ES majors at Macalester.

Macalester College Environmental Studies majors upon graduation should have:

- The ability to think systematically about complicated problems.
- The ability to recognize and communicate with diverse kinds of specialists.
- The ability to understand the premises of diverse disciplines.
- The ability to appreciate the nature of scientific uncertainty and controversy.
- The capacity for consensus building and appreciation of group dynamics.

- The ability to appreciate the nature of our species, spirituality, aesthetics, and relationships and differences among cultures.

3. Audit Transcripts

In order to assess our students' movement through the curriculum and to insure that students have sufficient breadth and depth in Environmental Studies, we will conduct a yearly audit of student transcripts. We will examine if there are significant "holes" in students' courses of study and if there are particular areas where we should strengthen our curriculum or discuss with adjunct department ways to better integrate our courses.

4. Senior Survey

We will use a version of the Psychology majors survey to assess student satisfaction with their education in the ES department. This will include asking students about their degree of comfort with their knowledge about certain areas of ES and will ask them to make suggestions for improving the course of study that we require and provided for students. A copy of the questions we plan to ask in our survey is found in Appendix 1.

5. Mastery assessment

For our seniors we will assess their master of the core competencies:

- The ability to think systematically about complicated problems.
- The ability to recognize and communicate with diverse kinds of specialists.
- The ability to understand the premises of diverse disciplines.
- The ability to appreciate the nature of scientific uncertainty and controversy.
- The capacity for consensus building and appreciation of group dynamics.
- The ability to appreciate the nature of our species, spirituality, aesthetics, and relationships and differences among cultures.

We will use a standard set of rubrics for each competency and will have the instructor(s) score each student relative to these competencies. The assessment form to be used is found in Appendix 2. The student's academic advisor will conduct an initial assessment and then the department faculty will meet to provide information that they may have which will add to the advisor's assessment.

6. Feedback

The ES Department will meet annually to review the various assessment data that we gather. These data include

- Audit of graduates' major plans to examine pattern of classes taken.
- Results of exit interviews
- Results of the Mastery assessment

We will use the results of this review to make changes to our curriculum. These changes could include changes in requirements and changes in the content of individual courses.

APPENDIX 1. 2009 ENVIRONMENTAL STUDIES GRADUATES SURVEY

Introduction

Please respond honestly to each of the questions in this survey. Your feedback about your experiences with your Environmental Studies major will help to shape activities that happen in the department in the future.

Skills Developed from ES major

1. How confident are you that you could …

	1 Not at All	2	3	4	5 Very
A. List the major environmental issues facing the world today?					
B. Describe the history of how these issues arose?					
C. Describe the major US policies related to these issues?					
D. Describe the major international policies related to these issues?					
E. Describe issues of social justice related to these issues?					
F. Describe the current state of scientific evidence and major areas of scientific dispute regarding major environmental issues?					
G. Describe the canon of literature that defines the field of Environmental Studies?					
H. Gather information about specific environmental issues?					
I. Evaluate the quality of the information you have gathered?					
J. Connect your learning in ES to other areas of study?					
K. Think in an interdisciplinary manner?					
L. Help a group achieve a desired outcome in a collaborative project?					
M. Develop a strategic plan to identify and implement local solutions to an environmental problem?					
N. Design an empirical study that tests or explores a basic scientific question important to environmental problem solving?					
O. Deliver an effective presentation at a conference?					

P. Work effectively in an organization, government agency or business dealing with environmental issues?					
Q. Make a case for your acceptance to a graduate program to advance your education?					

Coverage in the ES major

2. How satisfied are you with the …

	1 Not enough	2	3 Just Right	4	5 Too much
A. Breadth of your education in ES?					
B. Depth of your education in ES?					

3. How well exposed were you to …

	1 Not at All	2	3	4	5 Very
A. The different disciplines of ES (humanities, science, social science)?					
B. Careers available to people with an academic interest in ES (masters or doctorate)?					
C. Careers available to people with a professional interest in ES (NGO, government, industry or business)?					

ES courses that should be required?

4. What course(s) do you think the department should require all ES major to take?
5. If you mentioned something above, why do you think all ES majors should take the course(s)?

ES courses you wish you had taken?

6. What currently offered course(s) do you WISH you had taken while majoring in ES?
7. If you mentioned something above, why do you wish you had take (that/those) course(s)?

ES courses you think are missing from the curriculum?

8. What course(s) do you think are missing from our curriculum that you would like to see offered in the future?
9. If you mentioned something above, why would you like to see the course(s) offered in the future?

ES requirements you think should be dropped from the curriculum?

10. What course(s) do you think should be dropped as required for the ES major?
11. If you mentioned something above, why would you like to see the course(s) dropped from the ES requirements?

12. If you have any additional comments that you would like to share, please use the textbox below.

APPENDIX 2. LEARNING OUTCOMES RUBRIC USED FOR SENIORS.

Student Name _____

Learning Objectives	**Level 1**	**Level 2**	**Level 3**	**Level 4**	**Level achieved**
The ability to think systematically about complicated problems. (based on written work and presentations)	Treats related ideas or data as unrelated, or draws weak or simplistic connections	Begins to establish connections and perceive implications of the material	Brings together related data or ideals in productive ways, thoroughly discusses implications of material	Develops insightful connections and patterns that require intellectual creativity	
The ability to understand the premises of diverse disciplines. (based on written work and presentations)	No connections to other disciplines.	Limited or forced connections to other disciplines.	Explores connections to other disciplines.	Meaningful and effective connections to other disciplines.	
The ability to appreciate the nature of scientific uncertainty and controversy. (based on written work and presentations)	Doesn't acknowledge that there is uncertainty or controversy.	Simply reports what one side or the other says with no discussion.	Acknowledges differing points of view within the scientific community, but overlooks or misrepresents some important points of view.	Is aware of and acknowledges differing points of view within the scientific community, and uses reasoned arguments to explain why he or she has adopted a particular view.	

Learning Objectives	Level 1	Level 2	Level 3	Level 4	Level achieved
The ability to appreciate the nature of our species, spirituality, aesthetics, and relationships and differences among cultures (based on written work and presentations)	Does not recognize the impact of human nature, spirituality, aesthetics and cultural knowledge and is unable to formulate clearly contextual analysis.	Recognizes the impact of human nature, spirituality, aesthetics and cultural knowledge but is unable to formulate a clear contextual analysis.	Recognizes the impact of spirituality, aesthetics and cultural knowledge and explains it using contextual analysis.	Recognizes the impact of human nature, spirituality, aesthetics and cultural knowledge and explains it using contextual analysis that addresses the relationship among different contexts.	
The capacity for consensus building and appreciation of group dynamics (based on group work)	All group members have different perspectives and are not willing to listen to those of the other group members. Bickering and miscommunication frequently occur.	Some members' perspectives are heard more frequently than others. No attempt is made to draw out the opinions and viewpoints of more "silent" group members.	All members are comfortable and satisfied with the means of making project decisions. However, not all members have a voice in the way those decisions are made.	All members are comfortable and satisfied with the means of making project decisions. All group members have a voice in decisions, whether they are finally made by the consensus of the group as a whole, or a leader or subcommittee. Decisions are made rapidly and efficiently.	

Learning Objectives	Level 1	Level 2	Level 3	Level 4	Level achieved
The ability to recognize and communicate with diverse kinds of specialists. (based on group work)	Several of the group members demonstrate an inability to work or communicate with others of differing knowledge and abilities. The members' work reflects apathy or callousness towards the feelings of others. As a result, group cooperation breaks down.	Some of the group members have difficulty adjusting communications to accommodate persons of diverse knowledge and sensitivities. Members do little to encourage respect in others for individual differences.	Most of the group members show the ability to communicate with persons of diverse knowledge and sensitivities. Each member respects the feelings of others.	Group members demonstrate insight concerning the feelings and levels of knowledge of the other members and exhibit this insight while communicating. Each respects individual differences and sensitivities of the others.	

Some rubric language provided by David Blaney, Political Science Dept. Macalester College.
Aesthetic and spirituality rubric derived from http://www.mdc.edu/learningoutcomes/documents/Group4Rubric.pdf.
Scientific uncertainty and controversy rubric derived from http://uteach.utexas.edu/ResearchMethods/CourseRubric.pdf.
Group dynamic rubrics derived from http://dhc.ucdavis.edu/faculty/seminarfaculty/rubrics/Group_Dynamics_Rubric.doc