**2010 Assessment, Center for Sustainability and the Environment**

**Narrative and Actions**

The assessment of the Center completed in 2009-10 consisted of two student surveys, an assessment of outcomes in ENVN 201, and compilation of information on alumni. This narrative summarizes these data and identifies actions to be taken as a result of this assessment.

In previous years, we had very poor response to the surveys we had sent out. This year, we began the process earlier, sending the surveys out prior to spring break, and sending a reminder our several weeks later. The response, 10 underclassmen and 3 seniors, was only slightly better, and our first conclusion is that we need to give more serious attention to getting surveys returned, perhaps by having students complete them in seminars and classes open only to CSE students. The data from ENVN 201 are complete, as they are based on the final essay that students wrote as part of the class. The data on alumni are largely based on information volunteered by those who keep in touch, and represent about 50% of alumni of the program.

Tabulated results of data gathered are appended. The following discussion is organized by the goals of the Center, as outlined in step 4 of our plan.

**Goal 1, Help students identify careers relating to the environment**

Our surveys addressed the issue of identifying careers in three ways. We ask students to describe their goals, and score the answers based on the level of specificity. We also ask where in the program they feel they are getting the most help in selecting careers. Finally, in ENVN 201, we ask students to write about how the trip and class experience impacted their career goals.

Table 1 summarizes the data on the specificity of students’ career goals. In the past, our surveys have suggested that Environmental science students generally proceed to graduate school, while Environmental studies students more commonly seek direct employment or spend several years in internships, working entry level jobs with NGO’s before attending graduate school or settling into their ultimate careers and are generally less sure of their goals upon graduating. We see this trend continuing this year. We have discussed this on the Advisory committee, and are divided as to whether it is a problem.

*Table 1 Summary of specificity of career goals*

*1- specific career or graduate program(U.of M. school of natural resources)*

*2- general career or graduate program (work in renewable energy, graduate work in ecology)*

*3- unsure (something related to sustainability)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| class | program | focus | grad | job | undec | senior next step |
| 2013 | science | 3 |   |   | 1 |   |
| 2013 | Science | 3 |   |   | 1 |   |
| 2013 | Science | 3 |   |   | 1 |   |
| 2013 | Science | 3 |   |   | 1 |   |
| class | program | focus | grad | job | undec | senior next step |
| 2012 | Science | 3 | 1 |   |   |   |
| 2012 | Science | 1 | 2 |   |   |   |
| 2012 | Science | 3 |   | 1 |   |   |
| 2012 | Science | 2 | 1 |   |   |   |
|   |   |   |   |   |   |   |
| 2011 | science | 2 |   | 1 |   |   |
| 2011 | studies | 3 |   |   | 1 |   |
| 2011 | science | 2 |   |   | 1 |   |
| 2011 | Studies | 2 |   | 1 |   |   |
|   |   |   |   |   |   |   |
| 2010 | studies | 3 |   |   | 1 | seeking employment |
| 2010 | science | 1 | 1 |   | 1 | Grad school |
| 2010 | science | 1 | 1 |   | 1 | Grad school |
| 2010 | studies | 1 |   | 1 |   | self employed |
| 2010 | science | 2 | 1 |   |   | internship |
| 2010 | studies | 2 | 1 |   |   | internship |
| 2010 | studies | 2 |   |   | 1 | americorps then grad school |

We also ask students to rank the importance of all elements of our program with respect to the goals of the Center. The results are tabulated in table 2 of the appended document. The survey suggests that career choices are shaped by a range of elements within and outside of our program, and not all elements affect all students in the same ways. One or more students identified courses in their major, advising in their major, concentration courses, advising in CSE, CSE internships, and CSE projects as being very important in helping them choose their careers. The strongest influences appear to be courses and advising within the major, followed by courses and advising in the concentration. On the other hand, one or more other students suggested little importance to these same program elements.

On this year’s ecology and environmental issues field trip to Oregon, students met with a total of 17 different professionals working in a wide range of fields. In their summative essay, students were asked to comment of the relevance of the trip to their career plans. Results from this survey, with results from the previous year’s survey are tabulated in table 2. These data suggest that most students learned things relevant to their planned career, while a small number were strongly influenced in their career choice by the experience.

*Table 2Effect of ENVN201 on career choice*

*1 no effect or no mention of career*

*2 student is unsure of career or has only general plans (research) and did not mention any significant impact of trip*

*3 student has plans which were reinforced, or student gained helpful insights on planned career path*

*4 trip exerted a strong influence or caused student to consider a new field*

*5 light bulb, student professed to be following a new choice because of the trip*

|  |
| --- |
| *Effect of trip on Students Career Plans* |
|  | 1 no effect | 2 unsure | 3 insights | 4 significant influence | 5 light bulb |
| 2009 | 4 | 4 | 5 | 2 | 1 |
| 2010 | 1 | 5 | 9 | 2 | 1 |

The similarity of the range of responses to those of last year’s students suggests that this is a general trend. Anecdotally, students who participated in both trips noted that the people we met this year were much more enthused and positive than those we met last year, whom the students felt “were just doing their jobs”, and many cited a general desire to have the same passion (but not necessarily the same job) as those we met this year.

Finally, our data on alumni suggests that a significant number do go on the environmentally related careers. The first cohort to have completed four years in the program graduated in 2004. We have data on roughly half of the students who have completed our program since that time. Of these 90% are in graduate programs, have advanced degrees, or have careers related to the environment. These are tabulated below.

*Table 3 Outcomes of Graduates*

|  |  |  |  |
| --- | --- | --- | --- |
| **Student** | **Year** | **Last known activity** | **Date of last communication** |
| Liz Bastien | 2004 | Masters in Hydrology ay Mew Mexico Tech | 2006 |
| Anne Provost | 2004 | Elementary teacher | 2006 |
| Taki Johnson | 2004 | M.P.A environmental science and Policy, Colombia University | 2006 |
| Alexis Martin | 2004 | Homeland security (07), Peace Corps (09-) | 2010 |
| Jen Swindlehurst Howland | 2004 | Senior City planner | 2010 |
| Leanne Jagusch | 2005 | Internship, animal exhibits at Disney World(06), Howell nature center(06), animal care technician Covance Labs, Madison WI(07-) | 2006 |
| Sam Hogg | 2005 | Intern, Vail resorts ('07) MBA MSU, Market Specialist, Next Energy (08-) | 2010 |
| Nancy Esposito | 2005 | Intern at several nature centers(06-08), ranger at NC State Park('10-) | 2010 |
| Lacy Doucette | 2005 | Ecology center Ann Arbor, (08); Graduate work in Landscape Architecture U of Minn. (09-) | 2010 |
| Derik Burkholder | 2005 | PhD student, marine ecology, Florida International University | 2009 |
| Erica Flock | 2005 | Marketing and Production Associate at Stylus Publishing, LLC  | 2010 |
| Rebekah Beall | 2005 | Iowa state University, Program for creative writing and the environment  | 2010 |
| Amy Hupp | 2006 | working for Kohls(07), environmental intern at Jeckyll Island, GA(08) | 2008 |
| Ryan Plantrich | 2006 | EPA temp (06), working as Environmental Chemist (07-) | 2007 |
| Daniel Obrien | 2006 | Americorps (06); Sigma Aldrich Informatics and green council member (07-) | 2010 |
| Deanna Babcock | 2006 | MSc Soil Science, N.C. State | 2008 |
| Dana Sauter | 2006 | PhD candidate, chemistry, Northwestern/Argonne | 2010 |
| Laura Beyer | 2007 | Artist in residence, Albion (08) | 2008 |
| Lisa Colville | 2007 | MSc geology (climate history) Wisconsin, PhD candidate, Wisconsin | 2008 |
| Chie Okada | 2007 | Employed, not environment, Dusseldorf Germany | 2009 |
| Kapil Mandraker | 2007 | MSc candidate, Ecology, State University of New York, College of Environmental science and Forestry | 2010 |
| Brooke Rickettson | 2007 | Volunteer Coordinator through ABLE with AmeriCorps at Buffalo Niagara Riverkeeper | 2010 |
| Megan Fitzpatrik  | 2008 | Enrolled Zoology Dept, Wisconsin | 2009 |
| Will Lewis | 2008 | Ornithology field work in Wisconsin | 2009 |
| Catherine Fontana | 2008 | MSc Env. Science, Trinity College , Dublin; Enrolled PhD Environmental Microbiology, Yale | 2009 |
| Catherine Game | 2008 | Completing masters at U. Michigan, school of Natural resources | 2009 |
| John Cawood | 2008 | Completing masters at U. Michigan, school of Natural resources | 2009 |
| Michael Eggleston | 2008 | Completing masters at U. Michigan, school of Natural resources | 2009 |
| Paul Gehras  | 2008 | MSc, London School of Economics, Environmental Policy and Regulation, presently Sustainable Transport Executive, the Means. UK. | 2009 |

In summary, the program appears to be functioning as promised, and our graduates are developing careers related to the environment. It is no surprise that the courses and advising in the students’ major play a central role in their choices of careers, as over half of our E-Science students progress on to graduate school in the field of their major. In fact, the most common cause of E-Science students not completing our program is their decision to focus entirely on their majors. As many of these students go on to successful careers, we do not see this as a problem. The center’s programs do appear to play an important supporting role for many students, and a primary role for some.

**Goal 2a Depth of Knowledge**

Because the career paths of our students are so varied, there is not a standard curriculum in the concentrations. Rather, the concentrations should be viewed as menus of courses, from which students chose appropriate sets of classes for their evolving career plans. This makes testing a specific knowledge base from the entire concentration impractical. ENVN 201 and 220 are the two classes devoted exclusively to students in the program. ENVN 220 has not been offered since Jahn Hakes resigned (it is scheduled for next year), so we have not been able to assess it. ENVN 201 serves as a means of illustrating the interdisciplinary nature of environmental issues by presenting a series of case studies in the area we visit. Assessment of this course is discussed below, under interdisciplinary perspective. Much of the depth of knowledge comes from courses in the major and concentration that are administered by other academic department. Our survey indicated that students perceive that career specific skills derive primarily from their majors, secondarily from their concentration courses (Table 2, appended survey summary). Unsatisfactory as this is, at present we have to rely on the assessment of these courses by the Departments offering them and trust that they are meeting or working toward the stated course goals.

We do track the acceptance rate of students into graduate programs (see table 3 above) and attempt to follow their careers as indirect evidence that students have an appropriate depth of knowledge, and all of our evidence is that students are adequately prepared. For example, students who enrolled in U. of Michigan’s School of Natural Resources reported that they were more broadly and thus better prepared for that program than their peers in their entering class. They specifically cited ENVN 201 and 220 as the reasons for this.

**Goal 2b Interdisciplinary Perspective**

We have data on the extent to which students gain an interdisciplinary perspective from both our survey and from students writing in ENVN 201.

On the survey (table 2 in attached summary), major courses, concentration courses, Concentration advising, ENVN 102, ENVN 201, CSE seminar, internships and CSE projects were all ranked by students as important or very important in developing and interdisciplinary perspective.

On the trip we had three themes, forest management, food (agriculture and restaurant business, and land use (urban and coastal). In their final essays, students were asked to discuss these themes from the perspective of the problems we saw, the practices suggested to address the problems, the policies that encourage these practices, the politics that affect implementation of the practices, and the values that underpin both the politics and the perception that the issue is in fact a problem. Essays were assessed to see the extent to which each student saw the trip in this holistic way. A summary of this assessment is presented in table 4.

Biomimicry is often a fruitful approach to a wide range of issues. As an exercise in critical thinking and applying an interdisciplinary approach to problems, students were asked, as an extra credit option, to suggest lessons that we learned about the ecological functioning of old growth forests that could be applied to an understanding of the social and economic functioning of an urban area. Is there an urban analog of an old growth forest? Is it a desirable model?

As with the students, this was intended as an “extra credit” assessment question…to see how many students would rise to the challenge of thinking in a novel way without forcing them to try. Despite a time limit on getting the trip reports in, nearly two thirds of the students took a crack at the question, and over half of these wrote insightful or exceptional responses (table 4).

*Table 4 Summary of students interdisciplinary thinking in ENVN 201Spring 2010*

*Columns 1-5Interdisciplinary understanding of trip themes*

*0- no mention*

*1- simplistic, no reference to trip or reading*

*2-acceptable, some reference to trip or reading, but lacking detail and abundant insight*

*3-insightful, abundant appropriate references to trip and reading, would instruct others*

*4-integrative, strong evidence of critical thought. Rreferences not only to trip and reading but other coursework as well*

*Column 6, Old growth/urban lessons*

*0- did not opt to answer*

*1- simplistic*

*2- showed mastery of both urban and ecological concepts*

*3-applied understanding of urban and ecological concepts in creative ways*

*4-strong critical thinking, drew in concepts from other classes, suggested creative connections but also limits and differences between systems*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | 1 problem | 2 practice | 3 policy | 4 politics | 5values | 6 old growth |
| Student 1 | 2 | 2 | 3 | 3 | 2 | 4 |
| Student 2 | 2 | 2 | 3 | 2 | 1 | 2 |
| Student 3 | 3 | 3 | 4 | 3 | 2 | 3 |
| Student 4 | 4 | 4 | 3 | 3 | 2 | 0 |
| Student 5 | 4 | 4 | 3 | 3 | 3 | 4 |
| Student 6 | 3 | 2 | 4 | 2 | 2 | 0 |
| Student 7 | 3 | 2 | 3 | 2 | 3 | 0 |
| Student 8 | 2 | 2 | 3 | 2 | 2 | 0 |
| Student 9 | 4 | 4 | 4 | 2 | 2 | 4 |
| Student 10 | 4 | 4 | 4 | 3 | 2 | 0 |
| Student 11 | 3 | 3 | 2 | 2 | 2 | 4 |
| Student 12 | 2 | 2 | 2 | 2 | 2 | 3 |
| Student 13 | 2 | 2 | 2 | 2 | 2 | 2 |
| Student 14 | 3 | 3 | 3 | 3 | 3 | 3 |
| Student 15 | 3 | 4 | 4 | 3 | 4 | 2 |
| Student 16 | 3 | 3 | 3 | 4 | 3 | 0 |
| Student 17 | 2 | 2 | 3 | 2 | 2 | 2 |
| Student 18 | 1 | 1 | 2 | 1 | 1 | 0 |
| Average | 2.8 | 2.7 | 3.1 | 2.4 | 2.2 |  |

The results showed that all but one of the students were able to adequately discuss the trips themes from a range of perspectives, and over half were able to do so in an insightful way. In the past we have had issues with the students being able to articulate the role of politics and basic values in environmental discussions. Although these still rank somewhat lower, it would appear that our paying more attention to these areas has resulted in students being more comfortable in discussing them in their essays.

The overall result of the assessment of the course is that we are satisfied that the experience developed an acceptable level of interdisciplinary understanding in the participants.

**Goals 2c and 2d Development of group and leadership skills**

Although this is an important part of our program, we are still learning how to effectively assess it. Our data this year consists of student perceptions from our survey, faculty impressions of students participating on our field trip, and outcomes of several student projects.

On our survey, (table 2 in the appended summary) students reported field trips, internships, projects, and the E-house were where they best learned both group skills and leadership skills. Students additionally see major courses as a place where they develop leadership skills.

On the field trip we camp and prepare our own meals. Weather and late meals, among other things, can cause stress. In this setting, we can effectively assess students group skills. Faculty were asked to assess the behavior of each of the students as a member of the group. Except for one student graded unacceptable by one faculty member, all ranked acceptable and over half ranked extremely helpful (helping clean up dinner or pack the vans when it was not their turn, using cheerful comments to deflect criticism or negative behavior). If nothing else, this is a measure of what a congenial group we were blessed with this year!

The Center encourages students to engage in sustainability- related projects, and views this as an effective forum in which students can develop and demonstrate effective leadership skills. Projects are suggested by students at our seminar meetings, and generally go through the stages of discussion, initial planning meetings, recruitment of additional students, and, finally, actions. Over half the ideas do not progress beyond the first or second steps. When projects do progress further, we take it as a measure of effective leadership on the part of students involved.

This year, two new projects are progressing to the action stage. Students interested in starting a student organic farm have completed a mission statement, received student senate funding, been granted a very nice plot of land near campus and because of these actions been given the CSE summer project stipend to support two students in developing the farm this summer. Students involved in the planning include Junior Jessie Baird, Sophomore Pryce Hadley, and freshmen Daniel Warschauer, Aaron Hiday, Cody Yothers, and Kaitlyn Pospiech.

Rachel Keener has worked with both the EI and the Whitehouse Nature Center in her efforts to start a bee-keeping club. The club has received two hives, and is working with David Green to also install an observation hive in the nature center building. It is exploring a relationship with local beekeeping clubs and considering hosting a beekeeping class on campus this February.

Additionally, Catie Castilli kept the Brit Bike program running last year, Pryce Hadley coordinated two Green Day sustainability fairs, Chelsea Barberi coordinated the CREATE elementary environmental education program, and Mallory Fellows coordinated the campus Recyclemania program. All of these students functioned quite independently and well in their roles, demonstrating significant leadership skills.

**Actions**

The most helpful part of this year’s assessment turn out to be the open ended questions (responses summarized in the appended data summary). From these it clear that our seminar needs reworking. We have used this as a forum in which students report on their internship experiences. It is clear, both from this survey and from low attendance that this format does not appeal to the students. Their suggestions that the seminars include more outside speakers and issues-based discussions are good ones. Last year we began experimenting with these formats, and the fact that the students are asking for more of this in this assessment exercise suggest that we should continue to move in this direction.

We continue to have some concern that it takes most students all four years to develop a clear idea of their career goals, and will discuss ways to help them make this important decision earlier, or at least give them more information earlier.