

ENVIRONMENTAL PROGRAMS AT LIBERAL ARTS COLLEGES: FINDINGS AND RECOMMENDATIONS FOR THE ANDREW W. MELLON FOUNDATION

I. INTRODUCTION

During the fall and winter of 2003-4, teams of representatives of the Andrew W. Mellon Foundation (AWMF) visited many of the schools that have received AWMF Environmental Studies Program (ESP) grants. The purpose was to learn from the experience of these schools what worked well, what didn't work so well, and to identify opportunities for further improvement.

We visited a total of 10 liberal arts institutions, including Barnard, Bates, Bowdoin, Colby, Colgate, Colorado College, Hobart & William Smith, Lewis & Clark, Middlebury, Mount Holyoke, and Whitman. These notes summarize the combined views of Sharon Hall (Colorado College), Stephanie Pfirman (Barnard College), [Tom Tietenberg \(Colby College\)](#), Ken Johnson (Skidmore), and Eugene Tobin and Danielle Carr from AWMF. In the following pages, we discuss our main findings about the status of ES programs at liberal arts colleges and list some of the programmatic and curricular initiatives that we found to be particularly successful. Then we list the primary factors that limit faculty commitment and student participation in ES programs and highlight needs articulated by ES program participants. Finally, we provide strategies for addressing common problems and recommendations for funding.

II. CHIEF FINDINGS

The AWMF ESP grants have had, without exception, a transforming effect on the programs receiving them. Most of these programs are filled with committed, stretched-to-the-limit faculty and the additional funds have allowed programs to move in directions that would not otherwise have been possible. Considering the fact that most colleges have been in a period of financial stringency recently, it is rather remarkable how effective the ESP grants have been in encouraging administrations to address some of these staffing needs. In general, we found that **ES programs are vibrant**. Student interest is high, students are fully engaged, and faculty participation is increasing. Also, it was interesting to discover that, from a funding perspective, **one size does not fit all**. These programs are at different stages in their evolution. Some are relatively new, while others have been around for more than 30 years. Some have already received significant administrative support, while others are only now building their case for such collaboration. However, despite the differences, **ES initiatives are supported, at least in name, at the highest levels of administration**. Not surprisingly, the degree of administrative responsiveness seems to be correlated with endowment size, but we encountered a dogged determination on the part of many administrators to somehow find the resources necessary to continue these initiatives even when the means by which that would be accomplished is not at all clear.

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1. Successful components of ES Programs

During our site visits, we met faculty, students, support staff, and administrators who were candid about the accomplishments and shortcomings of their ES programs. Following are the primary factors that have contributed to the successes of their initiatives.

a. Programmatic:

- ***Committed and compensated ES faculty.*** Core ES faculty (either joint appointments or fully within ES) are central to program sustainability. Environmental faculty are seen by students to be more “accessible,” “involved” and “engaged” than faculty in other departments. However, adequate release time for interdisciplinary course development or research is important for maintaining morale, productivity, and cohesion among ES faculty.
- ***ES initiatives that are integrated within institutional structure.*** Strong administrative support often follows student interest, but programs thrive especially when ES initiatives are integrated into college or presidential “strategic plans” or when interdisciplinary programs are a central part of academic structure.
- ***Key support staff.*** ES program manager, teaching associate, or technician positions provide directed support and continuity to faculty and have helped with coordination of the myriad activities that compose curricular or extra-curricular components of ES programs. These include newsletters, summer internships, logistics for community-based learning, liaisons for the career center and alumni offices, web page maintenance, and field, lab, or GIS assistance.
- ***A strong ES community.*** Students and faculty generally feel part of a strong, inclusive ES community that is strengthened by a common physical location dedicated to the ES program, seminar series with external speakers, field trips, campus sustainability issues, sponsored community events, periodic newsletters, and common first-year and capstone courses. Community building events within ES programs provide points of contact for ES faculty and students and forge connections between members, especially when the program is spread over disparate departments. Day-long field trips create a sense of community for majors (who may be affiliated with a number of departments) and allow potential majors to meet their academic peers. An organized ES community also increases collaboration with other professional programs within institutions.
- ***Interdisciplinary curricula.*** Students report that they get a lot out of interdisciplinary course work, including team teaching and learning the perspectives of their classmates from different fields. Both of these experiences are important to recruiting students from diverse backgrounds into the program.

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b. Curricular:

• **Experiential learning.** All of the programs we visited are using or developing experiential “hands on” learning in their ES curricula. Faculty-mentored research allows students to develop, analyze, and report on new ideas. Service learning and community-based learning (CBL) courses or experiences are among the most successful and empowering experiences for ES students during college. Other important experiential components include class field trips with hands-on activities and analyses, field-based introductory courses, capstone courses that use GIS and tackle applied problems (with help from the ES program manager), and laboratory analyses.

• **Local projects.** Most of the programs have carved out a successful niche for themselves by focusing some of their curricula on their local environment. There is a growing student/faculty involvement in campus and community decision-making including campus greening activities. This local focus has not only provided a productive source of inspiration for courses and “hands on” student research, but it has brought about a more mutually beneficial engagement with local communities involving interdisciplinary approaches and real world problem solving experience that are highly valued by students and faculty alike. Some programs have begun thematic, interdisciplinary research on a local environmental issue that involves ES faculty and students across divisions (Natural Science, Social Science, and Humanities).

• **Student research experiences.** Students value research experiences in ES topics and have benefited from summer stipends for research or internships. Most institutions see student research as critical for all majors and/or concentrators – in part as a way to balance breadth and depth -- and are seeking more support for summer students.

• **Coordinated ES/abroad experiences.** Students enjoy the opportunity to apply their course work while participating in hands-on immersion learning and problem solving in non-US settings. Coordination of a study abroad experience with in-depth research and/or study in ES topics provides thematic continuity across a student’s undergraduate experience.

• **Visiting post-doctoral scholars** can assist junior faculty with their research portfolios by providing research expertise in new area or in related fields. Post-doctoral positions with a specified teaching component provide course relief for faculty, thus enabling faculty to devote time to other needs within the ES program. Furthermore, these positions give the post-doctoral scholars a competitive edge on the job market by providing them with critical teaching experience and professional service opportunities.

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- **Visiting “fellows” program.** Students have found courses taught by local “practitioners” in environmental fields (e.g. sustainable agriculture, city planning, sustainable design) to be highly complementary to their other course work. These programs are mutually beneficial for students, tenured faculty (course relief), and visiting fellows (opportunity to interact with students), especially when the fellowship is structured with adequate coordination (by ES program manager), course preparatory time, mentoring for visiting faculty, and expense accounts for field trips, speakers, and incidentals.

- **Cross-departmental GIS programs** teach important skills to environmental graduates in a variety of different fields. GIS is an integrating technology that can foster community and a natural link between the social and natural sciences. If GIS programs have sustained support (personnel and equipment), they allow for the accumulation and archiving of student contributions that add to common databases and are useful in a variety of classes. When they are appropriately staffed, they can provide content and service-based links between the campus and the surrounding community.

2. Primary factors limiting faculty commitment and student participation in ES programs

Interdisciplinary ES programs at liberal arts colleges face a number of barriers that limit their sustainability and effectiveness. Here, we discuss the primary challenges that we found to be common across many institutions.

- **Limitations to faculty time.** Most ES faculty appear to have current workloads that are not sustainable. They need extra support to juggle the demands of their own research programs while meeting the demands of program coordination, teaching, students and the community. Faculty from related disciplines feel that lack of research and/or release time is the number one barrier to devoting time to their institution’s ES program. As a result, initiatives that are verifiably important to students (e.g. field trips) are often limited. Although the problems with faculty time are not restricted to ES programs, following are areas where ES faculty are particularly constrained.

Time for experiential and interdisciplinary teaching. Intensive field and laboratory courses, CBL, team-teaching, and faculty/student interactions outside of classes (e.g. hands-on experiences, research, field trips) are valued in ES programs but are disproportionately time consuming and not adequately factored into teaching loads (or cause resentment from other departments when they are). Faculty teaching interdisciplinary courses need to retrain and develop new coursework outside of their traditional areas of expertise without recourse to textbooks, and other teaching resources available for more established courses.

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Time for interdisciplinary research. While faculty mentored research is a traditional component of liberal arts institutions, we uncovered some barriers to the expansion of this role. Faculty research with students is encouraged by the institution, necessary for untenured faculty, and valued by ES majors, but faculty are not compensated (with release time or stipends) for taking students outside of their home department or training interdisciplinary ES students during the academic year or summer breaks. Furthermore, many environmental students want summer research in applied areas that may not be helpful to building faculty research portfolios. While the tradition of summer student research in the natural sciences is strong, many social science and humanities faculty need incentives to take on student researchers during summers.

Time to coordinate staffing of ES courses and extra-curricular activities. Faculty generally feel insecure about the sustainability of staffing in ES programs, even if the administration is supportive of interdisciplinary programs or has created a mandate for departments to teach in ES. A tremendous amount of time is necessary for the ES director to find faculty to teach the full suite of ES classes (from introductory through electives to senior capstone experience) while also finding commitments for internships and other student-community initiatives. Faculty time is needed to coordinate the diverse constituencies of ES faculty (who, in the most common case, are not physically located together). Administrative staff needs arise from the necessity for interdepartmental coordination and follow up for student-community interactions.

• **Diversity of personnel and fields of study.** Across our site visits, we found that ES programs were challenged by diversity issues, from ethnic to curricular. New faculty in interdisciplinary programs can be isolated (e.g. are the only hire in the program), and positions are often held by untenured women faculty who are overloaded with interested students, in part due to their accessibility. In some cases, these women hold undetermined appointments within programs. Non-urban institutions (and ES programs) are having difficulty recruiting minority students and faculty. For example, one faculty member, reporting on his efforts to attract a more diversity student body for ES, told us that some white students were put off by explicit references to “Race” e.g. “Race and the Environment” while some students of color were put off by “Environment”. Also, students in some programs desire an increased diversity in curricular options, often requesting more “practical” knowledge in ES issues and problem-solving experience. Students often want research mentors in areas outside the expertise of available faculty. Finally, current ES programs are not effectively recruiting students from other traditional disciplines because of few cross disciplinary faculty and a general lack of student understanding about the marketability and importance of an ES degree.

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- ***Lack of community and/or infrastructure.*** Due to the interdisciplinary nature of these programs, ES students and faculty have difficulty maintaining a sense of community if their programs lack common space or are in cramped quarters. Faculty members in different departments may lack common ground (literally and figuratively), ES students may lack common courses, interests, or opportunities for social interactions with one another, or students may feel that departmental ES faculty are not committed to advising them because of their interdisciplinary interests. Faculty and students feel dissatisfied if the lack of community and/or physical space limits the impact of the ES program on environmental literacy in the broader student body.

- ***Demands and shortcomings of an interdisciplinary curriculum.*** Environmental majors/concentrations tend to have more courses (12-18) than other majors (9-11) and are considered by majors to be challenging. However, opinions of other students and faculty are mixed about the rigor of the major and academic standing of the students.

III. NEEDS ARTICULATED BY ES PROGRAM PARTICIPANTS

During our site visits, members of the ES community voiced needs for faculty, staff, students, and curricula when thinking about the future of ES programming within their institutions.

Key to all of these possible initiatives was the need for **stable institutional support**. Although external funding was helpful, ES participants expressed concern about the sustainability of new programs and projects funded on short-term grants alone. Ideally, temporary, external funds would be “matched” by the institution after the end of the funding period.

1. Faculty Needs

- ***ES faculty in social science, public health, and humanities.*** Many ES programs grew out of the natural science faculty, and as a result, they lack sufficient participation across divisions. These programs require new ES tenure-track faculty in the social sciences who will represent non-traditional, political points of view and who will add a significant, stable economic/social analysis component to curricula. Other positions that are needed are in public health and/or toxicology (to help recruit students from other disciplines, such as biology) and the humanities.

- ***Support for faculty development.*** ES faculty require financial support to retrain in interdisciplinary areas (especially for traditional science faculty), or develop new courses in ES (e.g. a more effective capstone course that solves problems from perspectives of social sciences, humanities, and natural sciences).

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• **Faculty compensation for research and/or thesis students.** While funding exists for student research stipends (mostly, however, in the natural science disciplines), little if any compensation is available for faculty who mentor students in interdisciplinary research. Faculty need stipends or course reduction when taking research and/or thesis students. As time is the most valued resource by faculty, most prefer release time over extra pay. Compensation will encourage science faculty to engage in interdisciplinary student research and may encourage social science and humanities faculty to take environmental research students. Furthermore, release time will lighten the load of junior faculty who often feel compelled to take many research students to enhance their research productivity (for tenure or mobility).

2. Student Needs

• **Funds for interdisciplinary student research.** Currently, many natural science-focused ES students are relying on Howard Hughes Medical Institute or Keck funds for biological or geological research. However, these funding sources exclude the rest of the ES students who are interested in exploring environmental research opportunities in the social sciences or humanities. Furthermore, funds are needed above and beyond student stipends for activities associated with research efforts, including travel (international and domestic), study abroad experiences, laboratory/field supplies, conferences, and invited speakers.

3. Needs for support staff

• **ES Technician and/or Program Manager.** Most ES courses in the natural sciences have an instrumentation-heavy curriculum but share technicians between all of natural sciences. Often, these technicians are not supported in summer when faculty-student research is common. Dedicated ES technicians are needed to provide support for faculty research, courses, and GIS programs, and to act as an interface with ITS personnel. In addition, community-active ES programs need a dedicated Program Manager who is tied closely to the academic program and will provide support for both students and faculty (see description, above).

4. Courses, extra-curricular initiatives, and diversity

• **Programs to increase ethnic diversity of faculty and students.** ES programs need to link with other interdisciplinary programs (Cultural, Ethnic, or Women's studies) or offer courses that may be of interest to underrepresented students (e.g. Environmental Justice, Sustainable Development) and that highlight race/class issues in ES. Opportunities may arise to hire minority faculty into ES programs with the creation of a tenure-track position in Environmental Justice or related field of study.

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- **Programs to recruit new students.** In order to recruit new students to the major, ES programs need new field-based or environmental service-learning programs during new student orientation and during a student's first year. First-year ES courses should be taught by cross-disciplinary faculty to recruit from traditional departments such as Economics, Chemistry, and Biology. Other opportunities include first-year student research stipends, and a career open-house to showcase job and financial possibilities in ES.
- **Programs to build community** among ES students, faculty, and nearby institutions. These may include field trips, first-year and capstone experiences, seminar series or colloquia, a professional alumni magazine, or collaborative faculty-student research programs to increase intellectual interaction between ES program participants and with ES-affiliated faculty at nearby institutions. Support for "visiting" practitioners from the community to teach courses in environmental fields helps build connections between the college and its neighborhood.
- **Other infrastructure.** Although environmental programs engage in laboratory and field teaching and research, they usually have little technical support. The growing use of Geographic Information Systems -- GIS -- is exacerbating this problem. For environmental programs, GIS is an integrating technology that brings the social and natural sciences together, allowing departments to communicate on a common meeting ground. Establishing and developing local databases provides content for service-based links with the surrounding community, informs campus/community sustainability issues, archives student contributions and grows databases that can then be used in a variety of classes. However, maintaining a GIS lab needs sustained technical support and expanding its use to faculty who are unfamiliar with it requires some mechanism for training. Some ES programs would also like to expand their library collections to represent the interdisciplinary diversity of environmental topics.

IV. IMPLICATIONS FOR THE IMPROVED USE OF EXISTING RESOURCES

Based on our interviews, observations, and conversations, we recommend several strategies and funding opportunities to overcome barriers outlined above.

- **Curricular and faculty matters.** Affiliated departments need to commit courses to ES programs so that students and ES directors can be assured that courses will be offered regularly – even when there are sabbaticals, retirements, etc. It is possible to be flexible with this – i.e. over the next 3 years, the department will teach 4 courses, without specifying the details of who and when. Co-teaching between the natural and social scientists is important, but it requires even more care in ensuring faculty availability. Many institutions are recognizing that co-teaching requires more than just simple prorating in terms of faculty compensation and are awarding full teaching credit to all participants in particularly demanding courses.

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In addition, ES courses should involve senior faculty as well as junior, and those who are experienced should take care to ensure that new hires are not put in tenuous positions. A national meeting would be helpful to create a community between these isolated faculty members.

• ***Student research mentoring.*** To maximize faculty efficiency with mentoring undergraduates, it is best to get the students early (between 1st and 2nd years, or 2nd and 3rd years) and use a “cascade mentoring” approach, where repeat students provide continuity and help to mentor others. Faculty have found that it is generally a good idea to seek out students rather than posting an opportunity and taking whomever applies. It is important that ES programs (or institutions) find ways to support faculty who wish to mentor interdisciplinary or applied environmental projects over the summer.

• ***Enhancing diversity.*** Opportunities to engage a more diverse audience across campus and the community include co-sponsoring film series with other departments, hosting brown bag seminars, and engaging Multicultural Affairs Office in co-hosting campus events. Environmental faculty and students could run outreach programs to diverse high-school students and support minority K-12 students for summer programs. Funding should support summer student research for minority undergraduate students, especially for those who are not strong academically. Summer research experiences early in a student’s career can show students their potential outside of the traditional classroom environment. Post-doctoral fellowships will increase the exposure of the institution to minority faculty candidates, and target-of-opportunity tenure-track positions will help to keep them within the system.

• ***Facilitating community-based learning.*** Internship and CBL experiences with local organizations are rewarding, but good ones take a tremendous investment of time and coordination. At the least, campus greening activities (and work with the office of Campus Facilities) could be a focal point for ES students. It is a good idea to give mentors small stipends to recognize their contributions and to increase the likelihood that they will continue to take students. Furthermore, group research experiences are empowering when CBL efforts are incorporated into a class where students work together to solve a problem (e.g. first-year and capstone courses). Other options include bringing students to potential employers, via site visits, so they can see possible career paths. Programs need to hire a coordinator to work with students to locate these internship activities and to help mentor them over the summer.

• ***Integrating off-campus opportunities.*** Field trips (especially extended ones) should be offered if at all possible, for first year students and potential majors. One way to do this would be in an extended study program, perhaps 3-8 weeks in May/June/July. Faculty student and student-student relationships in study-abroad programs are maximized when environmental faculty teach in (or lead) the international programs.

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V. FUTURE FUNDING OPPORTUNITIES

Because one of the most common barriers to Environmental Studies programs in liberal arts colleges remains staffing (even in the most well-endowed institutions), strategies for alleviating those constraints are likely to continue to have a large impact. These programs need grants for:

1. New personnel

a. New tenure track positions in public health, toxicology, humanities, or social science (economics and environmental justice).

b. Visiting scholars to demonstrate the value of bringing local environmental professionals into the classroom. Colleges receiving AWMF ESP grants have been careful to use these scholars to complement, not replace traditional faculty. When designed well, these fellows not only bring a different dimension into the classroom (based upon life experience in the area), but they also serve as a bridge for building better relationships with the community that could then be a source of future projects and internships.

c. Support staff. Our visits to these schools have made it clear that providing overstretched faculty with some administrative help can have a very large impact on the ability of the program to reach the next level of excellence. These staff members play a crucial role in facilitating the diverse activities of the program (communication with students faculty and alumni and coordination of speakers, internships, field trips, GIS facilities, and service learning ventures). As well, in many cases, the occupants of these positions (due to their maturity and strong academic backgrounds) have been able to teach in the program, to counsel students and to significantly increase the number of contacts with environmental professionals in the surrounding communities.

d. Replacement faculty to allow key people to play a more frequent role in the environmental studies program. Most faculty members in environmental studies programs have obligations to a department as well as to the program. Sometime it is difficult to assure adequate staffing of ES programs without creating some problems in other departments. These conflicts could be avoided, or at least minimized, if funds were available to provide for replacement faculty.

e. Target-of-opportunity recruitment and hiring of outstanding underrepresented faculty. While programs in general have been successful in integrating women, they have been typically unsuccessful in attracting minorities. The few programs that have achieved a degree of success have found it necessary to go well beyond normal efforts to increase the diversity of the applicant pool.

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f. *Post-doctoral associates.* Institutions should consider hiring post-doctoral associates (three years recommended) to bring new areas of expertise, collaborate with faculty on research, provide course relief, and expose new future-faculty to (or recruit them into) a career in liberal arts education. Start-up money for post-docs (even \$10,000 over 3 years) is a good idea and allows them the independence they need to make their own mark and prepare for their next position. Hosting institutions must assume the responsibility to assist post docs in their own individual development.

2. Incentives for existing faculty

While the suggestions noted above provide ways for increasing the availability of faculty and staff, in the face of very real resource limitations confronting colleges, those efforts by themselves will not be enough. It will be necessary to make better use of the existing faculty as well. Some funding ideas that help buy time and increase the level of research and innovation in education include grants for:

a. *Research in ES fields.* Writing a proposal to get research funding takes as much time as writing a paper, yet often only a modest infusion of support can raise current research to a new level or taken it in an innovative direction. For example, a tenured faculty member may want to shift her research from a global issue to one with local applications, thereby increasing synergies among research, teaching, and community involvement. Research grants will help ES programs expand their research directions and allow course releases or pre-tenure sabbatical.

b. *Faculty-student research stipends* for both students and faculty engaged in joint research over the summer. While we found these opportunities do exist in the sciences, they are more rare in the humanities, the social sciences, and in truly interdisciplinary research projects. In those areas it is more difficult for the faculty member to use these activities to generate publishable research.

c. *Faculty professional development in ES topics.* These grants would fund summer institutes to help faculty move their teaching into new areas (e.g. environmental justice, nature writing, or service learning), learn new analytical skills (such as GIS), or learn effective strategies for engaging students in faculty-mentored research interdisciplinary research areas (especially in the humanities and social sciences). Development grants would also provide incentives for faculty in other departments to join the ES program.

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3. Opportunities for students

Finally, we believe opportunities exist to make better use of the enormous energy, commitment and creativity that environmental students bring to the table. Some of these opportunities are:

a. Summer field programs. We suggest inter-institutional and/or interdisciplinary summer field programs that share resources, build community, and create a sense of place for faculty as well as students.

b. Internship stipends for mentors and students. One solution to the problem of a mismatch between student interest and faculty expertise is the better use of internships. Internships can provide students with an opportunity to explore areas of their interest not available on the campus and to lay the groundwork for analytical study upon returning to school. Grants serve the purpose of enabling students to take internships that are educationally valuable but may be rejected on the basis of financial necessity. Mentor stipends aid continuity, thereby decreasing initiation inefficiencies.

c. Student research travel and supply costs. Students find that the costs of doing research, and then disseminating what they have found, can be financially prohibitive. We suggest funds be used to offset the costs of acquiring data, traveling to and living at field sites, or traveling to conferences to share the results of their work.

d. Student-initiated projects and symposia. Students need grants to harness their ideas, energies, talents, and skills to work together to solve problems on campus and in the community. Student-initiated conferences could engage students from a large number of near-by institutions and could feature outside keynote speakers, break out groups and student research presentations.

e. Regional career fairs. Students typically feel a need for better career counseling in environmental studies. In particular, they want to develop a better understanding of the range of career opportunities in environmentally related fields and be exposed to information about employment opportunities when they graduate. Many potential employers in the environmental areas are non-profits that lack the resources to visit individual campuses. Thus, it is harder for students to make connections with these socially oriented class of employers than it is in some of the traditional sciences or business. Regional career fairs and alumni contacts would aid in career counseling. Students might also meet potential employers via site visits. Increasing awareness of the marketability and usefulness of an ES degree may help to increase minority enrollment in ES programs.

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