THE CASE OF THE GLOBAL ENVIRONMENT

From IOE to GE: A Brief History of the Global Environment Cluster

What drives us is that the environment is falling apart out there and we want to help fix it; and we know…that our own disciplines can't do this by themselves.[1]

Richard Vance (Organismic Biology, Ecology, and Evolution)

The Global Environment cluster is the brainchild of a group of UCLA faculty and administrators who are deeply concerned about the health of the environment, and, like Richard Vance, convinced that no one discipline can adequately address the daunting environmental problems confronting us in the new millennium. In the 1990s, these individuals addressed their environmental concerns by pressing for the creation of an organization that would coordinate and consolidate environment-centered activities across the campus. Their efforts were rewarded in 1997 when the Academic Senate established an independent, self-supporting, non-degree-granting program known as the Institute of the Environment (IoE). The Senate resolution establishing the new institute also charged it with fostering, augmenting, and coordinating interdisciplinary environmental research and teaching at UCLA, through a self-selected faculty drawn from a wide spectrum of campus disciplines and departments.

From its inception, one of the principal objectives of the IoE was to develop an academic program that would enhance the educational experience of undergraduate students by introducing them to virtually every aspect of the environment. To achieve this end, faculty affiliated with the Institute wanted to create multidisciplinary courses that would demonstrate how diverse disciplines address complex contemporary environmental problems. In these courses, students would work with faculty from different departments and schools, participate in IoE sponsored research programs such as the UCLA Marine Science Center, and conduct investigations into the socio-environmental issues of Los Angeles and Southern California.

The decision by the College of Letters and Science to launch an experimental general education cluster program provided IoE faculty with the perfect opportunity to turn these pedagogical reveries into reality. Indeed, the idea of offering incoming freshmen the opportunity of taking yearlong, collaboratively taught, interdisciplinary courses that were focused on topics of timely importance seemed perfectly suited to the instructional ambitions of the new Institute. Consequently, in 1997, a committee of IoE faculty comprised of Professors Nicolas Entrikin (Geography), Ted Porter (History), Melissa Savage (Geography), Keith Stolzenbach (Civil and Environmental Engineering), Richard Turco (Atmosphere Science), and Richard Vance (Organismic Biology, Ecology, and Evolution), among others, entered into a joint venture with the General Education Office to create a pilot cluster course entitled *The Global Environment: A Multidisciplinary Perspective*.

The course that emerged from these deliberations was designed to introduce freshmen to the ways in which different disciplines address the environmental degradation being visited on our planet by human activities. It featured a multidisciplinary teaching team of six ladder faculty, three senior graduate students, and one post-doctoral scholar. In keeping with the instructional aims of both the IoE and the cluster initiative, the syllabus of the new course also called for a considerable amount of reading, writing, discussion, lab work, and involvement in a number of field trips to local environmental agencies and research sites.

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[1] Richard Vance, interview by Office of Undergraduate Evaluation and Research, page 7. July 11, 2001.

In the spring of 1997, the Undergraduate Council of the Academic Senate approved this *Global Environment* cluster. The course was offered for the first time during the 1997-1998 Academic Year and 121 students enrolled in it. Five years later, the *Global Environment* remains one of the staple courses of the cluster program, and has provided nearly 700 students with a multidisciplinary perspective on the environmental issues of the day. The following table gives a profile of the number of freshmen, graduate student instructors, and faculty involved with the *Global Environment* over the last five years.

Table 6.1. Profile of The Global Environment: A Multidisciplinary Perspective: 1997-2002

	1997-98	1998- 99	1999-00	2000-01	2001-02	Total
The Global Environment: A Multidisciplinary Perspective						
Number of students	121	105	130	166	168	**690**
Number of Faculty	6	4	5	4	4	**23(10)***
Number of Graduate Student Instructors	4	3	3	4	4	**14**

* (#) Represents an adjustment to the total accounting for faculty who taught in more than one academic year.

Theory and Practice: Developing and Implementing a Freshman Cluster on the Environment

Dramatis Personae: Creating an Instructional Cohort for the Global Environment

I would say that forming a teaching team each year is one of my most challenging tasks as a coordinator.[2]

Keith Stolzenbach (Civil and Environmental Engineering)

All cluster coordinators confront a similar set of challenges when trying to put together an instructional cohort for their courses. First among these is the need to recruit a team of three to four faculty members, as well as an equal, or slightly larger, number of senior graduate student instructors (GSIs). Once this group is assembled, coordinators then confront the rather daunting task of having to integrate the different disciplinary discourses and pedagogical philosophies of these individuals into the stuff of a coordinated and coherent cluster course. Recruiting a team is made difficult by the fact that cluster participation requires a considerable commitment of time, which takes faculty and graduate students away from their research, publishing projects, and departmental teaching responsibilities. Creating an integrated instructional team tends to be complicated by not only the personal and disciplinary differences of its individual members, but by what Nick Entrikin (Geography) refers to as the faculty propensity "to prepare courses alone….without really talking very much about how they're doing it."[3]

On the recruitment front, the *Global Environment* has been blessed by its association with the Institute of the Environment. In addition to the five ladder faculty who hold positions in the Institute, over fifty faculty members are loosely affiliated with IoE. All of these individuals share an interest in interdisciplinary approaches to research and teaching on the environment, and they represent a significant cross section of disciplines, including the sciences, public policy, engineering, law, business, and public health. Over the last six years, the faculty complement of the *Global Environment* instructional team has been comprised of these IoE members, and their summer salaries and course releases for teaching in the cluster have been covered by the Institute.

Recruiting well-qualified senior graduate students for the cluster's discussion sections, while challenging, has also not posed a problem. Every spring the *Global Environment* faculty team sends out an announcement that the cluster is accepting applications for a number of GSI positions in the coming year. This announcement is sent to both affiliated IoE faculty and graduate department offices throughout the campus. Students interested in the positions are asked to submit a resume by the beginning of April, and this usually yields anywhere from eight to ten applications. The cluster's faculty team interviews these applicants and makes offers on the basis of their general teaching experience (particularly in the area of writing) and their familiarity with environmental topics. The graduate students who have accepted these offers over the last six years are normally engaged in environment-centered research and they are from such IoE affiliated departments as Civil and Environmental Engineering, Economics, Geography, History, OBEE, Public Health, and Urban Planning.

While recruiting an instructional cohort has not posed much of a problem for the *Global Environment* cluster, integrating the different instructional styles and disciplinary perspectives of

[2] Stolzenbach, Keith. "Coordinator's Report: GE Cluster/Environment M1/*The Global Environment*." Photocopy. September 2002. Page 1.
[3] Nick Entrikin, interview by Office of Undergraduate Evaluation and Research, page 2. August 1, 2001.

the individuals that make up these teams has often been challenging. Nothing captures this better than the following remarks of OBEE's Richard Vance:

We are a faculty with a range of different perspectives and we cannot speak as one person….I mean Rich Turco (Atmospheric Sciences) is more quantitative…than I am, and Keith Stolzenbach is an engineer. He [Keith Stolzenbach], for example, has a very practical perspective about how many million gallons of water you need per day to achieve some goal, and Turco, Nick Entrikin (Geography), and myself do not have the same perspective. Consequently, there is a little bit of a disconnect when you go from one person to another.[4]

Two factors have ameliorated this "disconnect" over the years. The first of these is the shared commitment of the *Global Environment's* faculty to interdisciplinary research and teaching. The second is the extraordinary good fortune of the cluster in having Keith Stolzenbach as its coordinator for the last five years. In this role, Keith has been able to provide the *Global Environment* cluster with both stable leadership and an institutional memory of the course's various permutations since 1997. Drawing on his experience, the cluster's faculty and GSIs have approached the challenge of creating a collaborative interdisciplinary teaching team in the following ways:

- In light of the fact that a large faculty cohort makes it difficult to arrange team meetings, have in-depth discussions, and plan a coherent set of linked lectures, the cluster's faculty complement is limited to no more than four individuals. In keeping with the interdisciplinary nature of the cluster, one of these four faculty is a social scientist.
- These faculty members are recruited as early as possible to ensure that they have an opportunity to become familiar with each other's disciplinary backgrounds, research interests, and teaching philosophies.
- All decisions pertaining to the subject matter of the course and how it is to be integrated are taken collectively by the faculty team. During the course of the year, faculty collaborate on case studies, *vignettes*, and debates as a way of demonstrating to students how their disciplines work together to address common environmental problems (for more on this see the next section *What's Worth Knowing?*).
- GSIs are recruited in the winter quarter of each academic year and the faculty team interviews and hires them collectively.
- Every effort is made to fully integrate the cluster's GSIs following their recruitment. As such they are treated as "colleagues," as opposed to "apprentices," and their input is sought on everything from course subject material, to assignments, tests, and grading. GSIs are also afforded the opportunity to participate in course lectures and given wide latitude in the design and teaching of their discussion sections and labs. To ease GSI workload, faculty grade a portion of the course's tests and major papers.
- Faculty and GSIs are expected to attend all cluster planning meetings, lectures, and social events.

Interviews with faculty and graduate students who have taught in the *Global Environment* indicate that these arrangements have been remarkably successful in creating cohesive, truly collaborative instructional cohorts for the cluster. Indeed, the members of these teaching teams tend to agree that their work together has made them more reflective about their teaching, more sensitive to other perspectives on the environment, and more attuned to what is entailed in

[4] Richard Vance, interview by Office of Undergraduate Evaluation and Research, page 6. July 11, 2001.

interdisciplinary research and instruction. One can get a sense of this from the following remarks of Richard Turco (Atmospheric Sciences):

I've learned a lot from participating in this cluster. You know each of us gets pretty specialized, and, just because of a lack of time, I can't go read a book on ecology. I wouldn't normally do that. There's no incentive for me to do that because I've got lots of other things to do. But sitting in on the cluster lectures, listening to an ecologist go through all of the arguments, nomenclature, and methodology of his field, I'm learning what they do. Cluster teaching is a very valuable exercise for people who want to be interdisciplinary and understand each other's fields.[5]

Cluster GSIs also indicate that the organization of the *Global Environment's* teaching team could serve as a model for faculty/graduate student instructor relations campuswide.

Recruiting and integrating academic personnel, however, is quite different from figuring out what first-year students need to know in order to participate in today's worldwide environmental discourse. In the section that follows, we address the challenges that *Global Environment* faculty and GSIs have encountered in trying to determine what they should teach and how this often disparate material should be organized and presented to their students.

What's Worth Knowing? Identifying and Integrating the Subject Matter of a Global Environment Cluster

The "environment" is a good label, but it's this tremendous range of topics. From the very beginning we've had difficulty deciding what to teach and how broad and deep this teaching should be.[6]

Keith Stolzenbach (Civil and Environmental Engineering)

When asked what they want their students to learn, *Global Environment* faculty usually single out three things. First of all, they want their students to achieve a deeper understanding of the complexity of the earth's environment. This includes learning something about the properties and interactions of the planet's air, water, and soil, as well as the impact of human activities on these natural systems. Secondly, they want their students to develop a broad "environmental literacy," or an ability to critically assess reports, policy statements, and proposed legislation on such issues as global warming, drilling oil in the Arctic National Wildlife Refuge, and protecting endangered species. Finally, they hope to inculcate in their students a way of looking at the world that is sensitive to the connections and interconnections that exist among organic and inorganic systems.

While these learning objectives command a consensus among the faculty who have taught in the *Global Environment* cluster, there is considerably less certainty with regard to how they are to be achieved. Perhaps nothing illustrates this better than the difficulty faculty encounter when trying to determine the subject matter that a first year, non-science student needs to know in order to achieve a "deeper," or more sophisticated, understanding of how the environment works. If they focus on material that provides students with an intensive coverage of major environmental factors like water, air, soil, and population, than other important ecological concerns, such as plants, marine biology, and desert life, are likely to receive short shrift. On the other hand, if faculty attempt to cover all of these topics, the result is a very broad survey course that gives students only the most cursory of introductions to the many facets of the environment.

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[5] Richard Turco, interview by Office of Undergraduate Evaluation and Research, page 13. June 19, 2001.
[6] Keith Stolzenbach, interview by Office of Undergraduate Evaluation and Research, page 16. June 19, 2001.

Further complicating this question of what to teach in the *Global Environment* is the course's status as a so-called "bridge" cluster, i.e. as a course that is designed to demonstrate to students how north and south campus disciplines can work together to address a topic of common concern. As envisioned by its founders, *Global Environment* is supposed to achieve this end by providing its students with both a solid grounding in the environmental sciences, and an introduction to the ways in which human political arrangements, economic developments, and cultural attitudes shape the planet's ecosystems. Consequently, the subject matter of the course is meant to include not only material from the physical and life sciences, but from the social sciences as well. As with the natural science component of the course, however, the cluster's instructional teams struggle with the question of what this social science material should be, and at what depth it should be taught. As Keith Stolzenbach notes "this cluster is both blessed and cursed with abundant material spanning the huge range of topics in the general area of environmental studies. Deciding what *not* [my emphasis] to present is the real problem."[7]

While identifying the subject matter of the *Global Environment* is problematic, finding a way to integrate such disparate material into a coherent whole that is comprehensible to first year students is even more challenging. The cluster's first two instructional cohorts approached this issue in what might be called a multidisciplinary fashion. That is each member of the teaching team was assigned a block of lectures and asked to introduce students to the environmental concerns and methodologies of their discipline. While this approach allowed faculty to focus on their areas of expertise, and also provided students with a fairly solid introduction to a number of different environmental and social sciences, it was neither collaborative nor interdisciplinary. Students did not get any sense of their faculty as being part of a teaching team, and the presentation of the material did little to foster an awareness of the ways in which human and natural environments are connected.

In subsequent years, the *Global Environment's* instructional teams have considered a number of different approaches to the problem of integrating the cluster's diverse subject material. The most obvious of these is one that would involve structuring the course around a series of environmental case studies, e.g. Should we use DDT in the fight against malaria? How do we reduce global carbon emissions? Can we feed China? Such topics are timely, they are of concern to social and natural scientists, and they are broad enough to allow each member of a teaching team to demonstrate how their individual disciplines approach different kinds of environmental questions. The result would be a naturally integrated set of lectures that demonstrate the complexity of the environment, the value of interdisciplinary inquiry, and the need for an environmentally literate citizenry.

While the Global Environment's instructional teams seriously considered this case study approach, they never adopted it. In part, this is due to workload considerations. Though faculty work hard to adapt their material to the cluster format of the *Global Environment*, they nevertheless bring to the course a set of lectures with which they are familiar. A case study format would require them to substantially rethink and rewrite their lecture material, and this would take more time away from research and home department teaching. Another obstacle lies in the fact that many of the faculty involved in the teaching of the *Global Environment* have very strong ideas regarding what students need to know about their disciplines and how that material should be imparted. These individuals fear that a case study approach to the concerns of the cluster would make for a less rigorous and all too general introduction to the environmental sciences. As Keith Stolzenbach points out in his coordinator's report on the *Global Environment*,

[7] Stolzenbach, Keith. "Coordinator's Report: GE Cluster/Environment M1/*The Global Environment*." Photocopy. September 2002. Page 2.

"this is sometimes a matter of disciplinary jargon getting in the way—we simply do not speak the same language at times. But there are deeper differences, mainly disciplinary, I believe, but occasionally personal."[8]

At present, the *Global Environment* faculty have adopted a method of integrating their course material that uses both discipline-centered blocks of lectures and case studies. How this works is that during the academic year faculty present a lecture series that is organized into four blocks (two in the fall and two in the winter). Each block of lectures reflects the expertise of the four faculty members who make up the instructional team. During the 2002-2003 Academic Year, for example, *Global Environment* faculty from Engineering, Urban Planning, Organismic Biology, Ecology, and Evolution, and Atmospheric Sciences will present four blocks of lectures on water, population, ecology, and air.

Faculty present their lectures in an unbroken sequence, with time set aside at the end of their block for a case study that brings in the disciplinary perspectives of the other faculty members, as well as contributions from occasional guest lecturers. A faculty member addressing water, for example, will introduce students to the hydrologic cycle, the role of water in the production of food and the spread of disease, and how human activity affects the availability and quality of our groundwater. Then the entire instructional team (and any outside guests they wish to invite) will address a case study like water use in California, e.g. the role of population on the state's use of water, the effect of agribusiness on water quality, etc.

This method of integrating and coordinating the subject matter of the *Global Environment* cluster appears to have worked well for the course's instructional teams over the last three years. It accommodates the need of faculty members to present the basic concepts of their discipline, allows them to use previously prepared lectures, relates their lecture material to environmental topics of timely importance, and involves students in a collaborative, interdisciplinary teaching and learning experience. Keith Stolzenbach anticipates that the cluster's teaching teams will continue to use this hybrid lecture format well into the foreseeable future.

While these lectures are a critical part of the *Global Environment's* instructional effort, they are only one of the many pedagogical tools that the cluster's teaching team makes use of in its effort to introduce freshmen to the environmental discourse. Faculty presentations on air, water, soil, and population can and do deepen student awareness of the environment's complexity, but helping students learn about the many ways in which these systems relate to one another requires a wide range of activity--discussion, supplementary reading, lab experiments, and field trips. In the next section, we turn our attention to this learning process.

[8] Stolzenbach, Keith. "Coordinator's Report: GE Cluster/Environment M1/*The Global Environment*." Photocopy. September 2002. Page 3.

The Learning Process: Introducing Freshmen to the Environmental Discourse

We want the students to learn a kind of ecological thinking that requires this constant establishing of relations and interrelations among things. For example, when they are looking at research about particular kinds of social changes that go on in the nation. How does this affect population? How does this affect consumption? What relation does this have to climate? How does this impact the world water supply?[9]

Nicolas Entrikin (Geography)

How do you teach students to think "ecologically?" What kinds of texts, classroom activities, assignments, and living-learning experiences will make freshmen aware of the "constant establishing of relations and interrelations among things?" These are questions that the teaching teams of the *Global Environment* have grappled with since the course's inception. While the answers that these teams have come up with on this score are far from definitive, they do appear to have enjoyed some success in both introducing freshmen to a multidisciplinary perspective on the environment and improving certain skills essential to student success in a research university. In the following section, the pedagogical strategies that the cluster's instructional cohorts have adopted over the years are analyzed and appraised.

In the Classroom

Newsletters

Clusters have often been compared to operas in that they present their student audiences with an often convoluted plot line that is delivered in a foreign language by a diverse group of actors moving through a dizzying set of scene changes. As the previous section makes clear, this operatic analogy is an apt one for the *Global Environment*. Over the course of two quarters, a cast of roughly eight instructional performers present students with the highly complex story of the environment in four distinct "acts," each boasting its own disciplinary language.

Just as novice operagoers are often confused by the events being related to them on the stage, students in the *Global Environment* complain about being disoriented with regard to the sequence and significance of the lecture topics in the course. This is not terribly surprising when one considers the range of subjects being addressed in a given quarter, as well as the diverse cast of faculty, GSIs, and guest lecturers delivering this material. To rectify this problem, Keith Stolzenbach prepares and distributes a cluster program or newsletter before every lecture entitled *ENV MI Times*. This newsletter reproduces the relevant section of the lecture schedule from the syllabus, and briefly explains how it fits into the overall course plan. The *Times* also serves as a vehicle for announcements, and its back side is used to provide both an outline for each lecture, as well as a brief biography of any guest lecturer addressing the class. While some have dismissed this newsletter as unnecessary "coddling," Keith finds it an invaluable means of distributing course information and students find it helpful in keeping track of the cluster's progress.

"Vignettes" and Debates

It was noted in the previous section that the subject material of the cluster is delivered to students in four distinct blocks of lectures, each one reflecting the expertise of the four faculty members comprising the instructional team. While this arrangement allows the individual instructors to go into some depth about their different disciplines, it does not give the students any sense of the

[9]Nick Entrikin, interview by Office of Undergraduate Evaluation and Research, page 6. August 1, 2001.

faculty as being part of a collaborative team that is trying to find an interdisciplinary approach to environmental study. Even the case study format at the end of each lecture block only allows members of the faculty team to appear as visitors, or "quasi-guests," in the course segments that belong to a specific instructor.

In an effort to more fully demonstrate to students how research faculty from different disciplines can "connect" with one another on environmental concerns, the *Global Environment* instructional team has launched a series of in-class group presentations over the last two years. The way this works is that during the fall and winter quarters four unannounced "special lectures," in which a second faculty member or GSI shares the stage with the regularly scheduled lecturer, are presented to the class.

These special lectures take one of two formats. The first of these involves a faculty member or GSI taking the stage at the end of a period and presenting a ten minute "vignette" on a topic related to the main lecture. These brief sketches are designed to demonstrate to the students different, albeit interconnected, perspectives on an environmental question or concern. The second format involves setting up a debate between the main lecturer and another faculty member on a given topic. An example of this latter approach is an exchange that occurred between Professors Stolzenbach and Turco on the question of whether or not we can feed China. In the course of this debate, students were introduced to the ways in which expanding population, industrialization, and water use are related to one another and can impact the ability of a country to feed itself.

The degree to which these special lectures are effective in helping students understand the interdisciplinary nature of environmental study is unknown. Keith Stolzenbach reports that students in the class appear to enjoy these interruptions in the normal routine of the class. The attendance at these events is also fairly high because roll is taken and students receive a grade point for each special lecture that they attend. However, Keith acknowledges that the instructional team has received very few comments about them in their course evaluations.

Guest Lecturers

To familiarize students with the wide range of environmental research and activity that is going on in the Southern California area, the *Global Environment* faculty invite about five guests to give lectures each quarter. Most of these are ladder UCLA faculty associated with the Institute of the Environment, though an effort is also made to bring in lecturers from agencies, non-profit organizations, and research groups focused on environmental issues. Occasionally, a non-faculty lecturer from within UCLA, usually someone known to be a good speaker with information on a special topic, is invited to present a guest lecture.

Keith Stolzenbach reports that the use of guest lecturers is something of a double-edged sword. On the one hand, they provide students with a perspective (sometimes a non-academic one) on the environment that is different from that of the faculty team. Occasionally, however, the lecturers are not as good as the team anticipated. Furthermore, because guest lecturers have not participated in the class, their material does not always connect well with what is being covered in the course.

Discussion Sections/Labs

Discussion sections serve two functions in the *Global Environment* cluster. The first of these is to provide students with an opportunity to explore in greater depth many of the issues that are raised in the lectures. This often involves discussing with the cluster's GSIs a number of

supplemental readings taken from professional journals. These articles are related to the weekly lecture topic, and are selected for the purpose of introducing students to the subject matter and conventions of scholarly literature on the environment.

The second use of the discussion sections is to serve as laboratories. The experiments conducted in these labs are usually computer-based exercises (done in the Powell Library) with some quantitative analytical component. Examples of these experiments include *Ecobeaker* (a computerized simulation of the ecosystem), *Waste Disposal* (compute how to meet water quality standards), *California Water Balance* (design a plan for water in 2020), *Population* (a simple analysis of population dynamics*), Global Carbon Cycle* (design a policy for carbon emission reduction), and *LA GIS Lab* (see how GIS can help access geographic data). These lab exercises are designed to be done in one two-hour session, usually with a short report due afterwards (which is not treated as a writing assignment).

Assignments

Textbook

When the *Global Environment* was first launched in 1997 the cluster's faculty made use of a main ecology textbook and some supplemental paperbacks. Over the last three years, they have opted to use Botkin and Keller's *Environmental Science* as the single textbook for the course. This book is moderately expensive and the cluster's different instructional cohorts have found it to be a reasonably good text that covers most of the material that they wish to address in the course. Faculty have also tailored their lectures so that they correspond to the layout of this textbook and this has helped further integrate the subject matter of the course.

Student evaluations indicate that the cluster's textbook serves as something of a lifeline. It provides them with a sense of the overall structure and direction of the course, and they can consult it when they are unsure of ideas and theories that are raised in the lectures. Finally, because the text addresses a wide range of environmental science it also helps to demonstrate and reinforce the notion of the environment as a complex interconnected system of natural and human relationships.

Writing

Every one of the *Global Environment's* instructional cohorts has been committed to improving the writing of the students enrolled in the cluster. Consequently, writing assignments are one of the principal tools employed by the teaching team to introduce students to the environmental discourse. Although each year's team re-evaluates past writing assignments, they have largely followed the same format, i.e. three short papers in the fall quarter and one long research paper in the winter.

The short assignments are normally tailored to be training exercises in the use of library and web-based environmental materials. For example, the first of these assignments will normally require students to look up and write a summary of an article or treatment on some environmental issue. This is then followed by a second assignment that asks students to discriminate between different sources of information on the environment, and a third that requires them to provide a critique and a synthesis of a number of conflicting positions on a common environmental concern. The winter quarter research paper allows students to select an environment-related topic and explore it in some depth. These longer papers usually have multiple deadlines for their component parts, e.g. week four a bibliography is due; week five an outline/introduction; week seven a rough draft for peer review, etc. (See Attachement D for sample writing assignments).

With very few exceptions, *Global Environment* faculty and GSIs report a dramatic improvement in student writing over the course of the cluster. Indeed, a number of GSIs have noted in interviews that student writing tends to be fairly abysmal during the fall quarter, but that it markedly improves in the winter and is quite good by the end of their seminar experience. In their end-of-the-year self-evaluations, a considerable majority of *Global Environment* students report a marked improvement in their writing ability.

Living-Learning Experiences

Field Trips

Global Environment students are required to attend one field trip in both the fall and winter quarters. To accommodate their different schedules, five to six field trips are offered to students each quarter and they select the one they want. This year the teaching team will be taking students to visit the Los Angeles River, the Bellona wetlands, UCLA Stunt Ranch, the Tillman Water Reclamation Plant, and Santa Monica Bay (on UCLA's boat, the *Sea World*). Possible winter trips include the UCLA Energy Facility, a toxic tour of Los Angeles, an urban sprawl tour of Ventura county, and the Palm Springs windmills. It should be noted that even though these trips occur mostly on Saturday and Sunday mornings, they are quite popular with the cluster's students.[*]

Social Events

One of the goals of the cluster program is to foster "academic socialization," i.e. to develop social and intellectual bonds between students and their teachers, and, above all, among students themselves. The instructional teams of the *Global Environment* try to achieve this aim by holding a modest number of social events throughout the academic year. In the fall and winter, this involves an informal gathering with *hors d'oeuvres* in one of the dormitory lounges from 4:30-6:30 on a weekday evening (not a Thursday or Friday) during week four, five, or six of the quarter. Attendance normally ranges from 40-50 students in the fall, and 20-30 in the winter. In the spring, the teaching team hosts a BBQ in the Tree Patio opposite Covel Commons from 5:30-7:30 on a weeknight. Attendance at this event has been as high as 60-70 students and as low as 40-50. Though the numbers of students who attend these events is a fraction of the cluster's total enrollment, those who do show up appear to appreciate the chance for contact with the course's faculty and GSIs.

Examinations

Midterm and final examinations are given during the fall and winter quarters. The midterm in an hour and a half and is held in the evening of the fifth or sixth week. The three-hour final is at the time appointed in the *Schedule of Classes*. These exams do not have any multiple-choice questions. Instead, they are a mix of questions that require students to write short, medium, and long answers. Students are assured that the exams will not require the gratuitous memorization of dates or names. Questions on the final are cumulative, although material from the latter part of the quarter receives more emphasis. Previous exams are made available to students in the library, and in the coming year will be accessible through the cluster's website.

The cluster's examinations are prepared collectively by the entire instructional team. Faculty and GSIs are asked by the coordinator to submit possible questions. These are then distributed to

[*] Their popularity is also due to Keith Stolzenbach's tireless efforts to ensure that they go well logistically, are not too long, and avoid conflicts with major football and basketball games.

everyone before the meeting where the final questions are selected. A criterion that is often used in deciding to accept a test question is that it has to relate to material that is covered in at least two places in the class, e.g. the lecture, discussion sections, textbook, readings, etc. Following the finalization of the exam, the GSIs hold a review session in the residential life area several days before the test is given.

Following the exams, individual examinations are disassembled into separate pages and each page is graded by the same GSI or faculty member (faculty always help in grading the long questions). Students are identified on each page by a confidential ID number unique to the exam. After the grading is completed, the exams are reassembled and given back to the students. An examination key is published on the cluster's website and students contesting their grade must see the appropriate GSI or faculty member who graded their answer.

Keith Stolzenbach reports that this examination process has worked well over the years. Students occasionally complain that there is too much to study and that the exams are difficult. However, they also indicate that they believe the tests are fair in that they cover material that's been discussed in the class.

Grading

Student grades are determined by a system of 300 points broken down as follows:

Participation	30
Discussion Section	20
Field Trips	5
Special Lecture	5
Laboratory Work	45
Writing Assignments	75
Midterm	60
Final	90
Total	300

The grade curve in the cluster is B centered and that is the grade the majority of students get. The cluster teaching team does not try to curve the grade profile, but they do pay attention to both the number of As and Cs given and to the absolute percentage of the grade cutoffs. Almost always the A/B cutoff is at 90% and the B/C cutoff is about 80%. The grade percentages for the course have ranged in recent years from 21-31% As, 49-62% Bs, and 6-23% Cs. Very few of the students in the *Global Environment* get Ds.

There tends to be some student grousing about grades in the *Global Environment*, particularly after the fall quarter. Student evaluations also indicate, however, that while most of the students find the grading in the course to be rigorous, they also consider it to be fair. Keith Stolzenbach reports that he has only had to deal with one or two real complaints about grading each year.

Assessing the Learning Process in Global Environment

Trying to assess the effectiveness of these different instructional strategies in achieving the learning objectives of the *Global Environment* teaching teams is a difficult task. Surveys asking student participants to comment on any effects that they think the cluster experience had on their

intellectual skills were administered to *Global Environment* students over the last three years. A clear majority of students enrolled in the course indicated that they actively participated in more discussion, writing and rewriting of papers, collaborative work with other students, and interaction with faculty and GSIs than in their other courses. Majorities also reported that they found the *Global Environment* cluster an intellectually stimulating experience that made them think more critically about environmental issues. Open-ended student comments regarding what students regarded as the best aspect of the *Global Environment* experience netted some of the following remarks:

The best aspect was the variety of information covered and the fact that I got to learn it from various professors.

It was very interesting to learn the economic and political aspects of environmental issues. I did not expect these to play a role in the environment's problems.

The multidisciplinary learning experience it provided, including political, social, cultural, environmental, geographical, and economic knowledge.

Learning how to do good research in on-campus libraries and learning about the predicament we are faced with in conservation efforts.

It was about topics that directly impact me. It taught me how to debate, and think critically as both a politician and a scientist would on the environment.

I am much more aware of the environment and open to discussion on the ecological crisis. It has helped me think and analyze critically.

It covered so much information that is very current—I feel like most of the knowledge I acquired in this class can be related to almost all the other classes I took this year. I feel like I learned a lot.

This was the only class I've taken this year, which I actually think will make a difference in the future of our country and world.

Faculty and GSIs report that they believe students leave the cluster with considerably more awareness of the environment—its complexity, interconnectedness, and political importance—than when they start the course. There is also general agreement among the members of the *Global Environment's* various instructional teams that student writing improves markedly over the course of the year. One other thing that faculty and GSIs agree on regarding the learning process in the *Global Environment* is that the fall and winter quarters lay the groundwork for engaging and intellectually stimulating spring seminars, and it is to that experience that we will now turn.

Putting It All to Work: The Global Environment Seminar Experience

The seminars are very mixed in our course…. Some students have a chance to get involved with ideas, others have the opportunity to learn research techniques, and a few seminars give their participants the option of doing fieldwork. In the end, I think the students felt that they had been exposed to something that made them feel much more like a college than a high school student.[10]
Nicolas Entrikin (Geography)

One of the principal aims of the cluster program is to help first-year students make the transition from high school to college by familiarizing them with the ways in which a research university actually works. Key to the achievement of this goal is the spring seminar where freshmen have the opportunity to really explore a cluster-related topic in some depth with a faculty member or senior GSI. Building on the knowledge and skills that they have acquired during the fall and winter quarters, cluster students study either one or all of the following in these small learning forums:

- A current research project of their instructor.
- A specific topic of abiding and/or current scholarly interest in one or more disciplines (e.g. "global warming" in environmental science, "string theory" in physics, or the reasons for the collapse of Communism in Eastern Europe.)
- A text or texts regarded as central to the development of our knowledge and understanding in different fields of human inquiry (e.g. Marx's *Capital* or Darwin's *Origins of the Species*).

In the *Global Environment*, seminar topics cover a wide array of environmental subject matter. Each year, at least four of these spring seminars are designed and taught by the course's GSIs. An additional three to four of these seminars are offered by either cluster faculty, IoE affiliated faculty members, or visiting scholars. The preliminary titles of these seminars are offered in the fall and winter syllabi, and around the fifth week of the winter quarter, students are given 1-2 page descriptions of each course's seminar topic and requirements (writing, exams, field trips, etc.) At the time that these descriptions are distributed, everyone offering a seminar is introduced in lecture and given some time to talk about what they hope to cover in their course.

The spring seminars are, without question, one of the high points of the *Global Environment* cluster experience. These seminars afford the cluster's GSIs the rare opportunity of designing and offering a course of their own, an experience that is valuable to them intellectually and professionally. Faculty enjoy these courses because they offer them an opportunity to introduce a whole new generation of students to their work. And for freshman students, cluster seminars provide them with a small format learning environment that is unlike anything that they have experienced in high school or college.

Student surveys and faculty/GSI interviews both confirm the success of these cluster seminars. A considerable number of the students surveyed in the 2001-2002 year-end *Global Environment* cluster survey, for example, indicated that the spring seminar was the single best aspect of their yearlong experience in the course. The principal reasons that these students cited for their enjoyment of the spring seminars were:

- The ability to work closely with an instructor on a project of shared interest;

[10] Nick Entrikin, interview by Office of Undergraduate Evaluation and Research, page 8. August 1, 2001.

- Increased interaction with one's fellow students; and
- The freedom to pursue a research interest of their own in some depth.

Faculty and GSIs also cite the spring seminars as one of the best aspects of their cluster experience. In doing so, instructors note that *Global Environment* students bring a special intellectual and social dynamic to their courses. The fact that these students have been exposed to a broad range of environmental subject matter during the fall and winter quarters enables them to engage in substantive seminar discussions. The writing and library assignments that cluster students complete prior to the spring quarter frees up precious time that might otherwise need to be spent on the basics of college composition, or the location of environmental research materials on campus. And the familiarity that the cluster's students have with one another and the different instructors in the course also makes for a more comfortable classroom environment that is conducive to discussion and group work.

Final Thoughts: Reflections and Ruminations on the Global Environment Cluster Experience

As the foregoing makes clear, the *Global Environment* cluster has been a remarkably stable and successful course. This cluster enjoys the support of a considerable number of faculty on campus, and it is blessed with excellent faculty-graduate student instructor relations. The course's various instructional teams have found a way to integrate and teach their often disparate subject matter, and they have managed to achieve this end through a process that has exposed freshmen to a wide range of best practices in teaching and learning. Assessment data also indicate that the *Global Environment's* spring seminars provide all of their participants—faculty, GSIs and students alike—with a stimulating and enjoyable intellectual experience.

A number of factors appear to be responsible for the overall success of this cluster. They are:

- The symbiotic relationship between the *Global Environment* cluster and UCLA's Institute of the Environment. As this study makes clear, the *Global Environment* has been the ideal vehicle for the advancement of the instructional aims of IoE. In return, the Institute has provided the cluster with financial support and a stable pool of faculty and GSIs that are committed to interdisciplinary teaching and research.
- The *Global Environment* has enjoyed the good fortune of a single coordinator for five of its six years of existence. Keith Stolzenbach's patience, good humor, and long experience at the helm of this cluster have provided the *Global Environment* with an unparalleled stability and an invaluable institutional memory.
- The various instructional teams of the *Global Environment* have worked together over the years in a truly collaborative fashion. Everything from syllabus design to the grading of student assignments has been done collectively and with input from both the cluster's faculty and GSI complements.
- The cluster's faculty take the interdisciplinary, collaborative aims of the cluster program seriously. They continue to struggle with the question of how best to integrate their different disciplinary languages into a set of lectures that deepen freshman understanding of the environment's parts, while at the same time demonstrating how those parts are interconnected in a seamless whole.
- The cluster's teaching teams have not shied away from experimenting with a wide range of instructional best practices—newsletters, debates, vignettes, research based writing assignments—in their efforts to advance the aims of their course.

Taken together, all of these efforts have made, and continue to make, the *Global Environment* an entertaining, educational, and enlightening experience for its participants.