



# Self-Study

March 2002

Program on the  
Environment

A CATALYST FOR ENVIRONMENTAL STUDIES  
AT THE UNIVERSITY OF WASHINGTON

*“Once in a while a program comes onto the educational scene that really makes a difference in fostering and developing interdisciplinary learning. I believe that this can be said of the Program on the Environment (PoE).*

*...PoE has pursued a steady and even-handed course, benefiting significant sectors of this university, providing to students truly interdisciplinary and objective environmental education and opportunities that would otherwise not be offered.”*

William R. D. Wilson  
Chair and Professor  
Mechanical Engineering

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# I. CONTEXT

## A. NAME OF UNIT AUTHORIZED TO OFFER DEGREE

General and Interdisciplinary Studies

## B. SCHOOL OR COLLEGE

Arts & Sciences

## C. EXACT TITLE OF DEGREE OFFERED

Bachelor of Arts in Environmental Studies

## D. YEAR OF LAST REVIEW

The Program on the Environment is a new unit. Its programs have not been reviewed previously.

## E. BRIEF DESCRIPTION OF THE FIELD AND ITS HISTORY AT THE UNIVERSITY OF WASHINGTON

The origins of the field of Environmental Studies in academic institutions date largely to the 1960s and the initial widespread realization that many local environments are seriously degraded and that the state of the planetary ecosystem is indeed precarious. Rachel Carson became a household name, the Cuyahoga River went up in flames, and the “population bomb” became a topic of common discussion. Colleges and universities established programs to focus on environmental issues that had suddenly erupted into public consciousness.

The intervening years have brought changes in focus and language, but the core problems remain and many have significantly worsened. A recent major study by the National Research Council, *Our Common Journey: A Transition Toward Sustainability* (1999), asks quite seriously: “Can the transition to a stable human population (projected to occur toward the end of the present century) also be a transition to sustainability, in which the people living on earth over the next half-century meet their needs while nurturing and restoring the planet’s life support systems? The toll of human development over the last half-century on the environment suggests that the answer may well be ‘no.’” The study then goes on to document signs of progress and to balance the bad news with the good. There is no doubt, however, that the situation is profoundly serious and calls for a concerted effort at all levels, from national governments and international bodies to the actions of individuals in their private lives.

The study is also very clear on the point that, in order for sustainability to be achieved, there must be a constant, positive and productive interplay between science and technology on the one hand and the multiple domains of policy, law, economics and business, and human culture and values on the other. It identifies as areas to be sustained Nature (earth, biodiversity, ecosystems), Life Support (ecosystem services, resources, environment), and Community (cultures, groups, places). Similarly, it identifies as areas to be developed People (child survival, life expectancy, education, equity, equal opportunities), Economy (wealth, productive sectors, consumption), and

Society (institutions, social capital, states, regions). For the academy the message is clear – no discipline-bound approach will suffice, even though the depth of understanding and technical competence associated with traditional programs of study continue to be indispensable. The National Science Board in the study, *Environmental Science and Engineering for the 21<sup>st</sup> Century* (2000), put forward a similar viewpoint, though focused on technical subjects.

At the University of Washington, the first attempt to create a structure in which the breadth of competencies required to comprehend and deal with environmental issues could be provided was the Institute for Environmental Studies (IES), founded in 1972. It was eliminated in the early '90s during a period of severe budget cuts.

In 1995, Pres. McCormick appointed a Task Force on Environmental Education (TFEE) to re-examine environmental education at the UW. The TFEE presented its report in Spring of 1996. Following a thorough review by deans, chairs and directors, the first step in launching the new unit was the appointment of two Co-Directors, John M. (Mike) Wallace from Atmospheric Sciences and John M. (Johnny) Palka from Zoology, in Spring Quarter of 1997. In rapid succession, a name for the new unit was adopted, Program on the Environment (PoE); a large Board representing the broad environmental constituencies on all three UW campuses was appointed; and the first two staff were hired. The B.A. degree in Environmental Studies was designed and approved in 1997-98, in time for the first students to be admitted in Autumn Quarter, 1998.

As this capsule history shows, PoE is a young program: only 5 years have elapsed since the first Co-Directors started to organize it working from their departmental offices in the spring of 1997, barely more than 3 1/2 years since the first core course was offered in the autumn of 1998. During this time the entire infrastructure of the program has had to be built from scratch (we started with three hand-me-down desks, two filing cabinets, and a vase of flowers), in addition to the program building that is described in the body of this self-study.

A central feature of the design of PoE was that it was simultaneously (a) to develop its own interdisciplinary degree program in Environmental Studies, (b) to support environmental efforts in the myriad units of the University in which they are (or should be) represented, and (c) to seek ways in which to meld them in such a way as to produce the proverbial “whole that is greater than the sum of its parts”. It was to do this as a facilitating organization without faculty, and therefore to base its work squarely on productive collaborations with mainstream units. Finally, it was to do its work in a thoroughly interdisciplinary way, reflecting the perspectives articulated in the TFEE Report and the various studies mentioned above, being scrupulously fair to all viewpoints as well as all disciplines, and serving as a model and catalyst for other interdisciplinary initiatives at the institution.

PoE has accomplished a great deal in its short history. It has implemented a fine interdisciplinary undergraduate degree, become the home and/or support unit for several interdisciplinary programs at the graduate level, developed close working relationships with a very large number of faculty across all three campuses of the UW, and established an unprecedented collaboration among advising staff in all units offering environmental degrees. Many faculty have proposed courses to offer through PoE on their own initiative, and a number of curricular partnerships with

other units are being established. PoE has developed and deliberately nurtured a way of working that is thoroughly inclusive, and because of this faculty have sought its services in facilitating discussions in contentious areas.

This first review provides an excellent opportunity to reflect on how best to build on PoE's successes to date and where to make adjustments so that the absolutely urgent area of Environmental Studies can best flourish at the University of Washington.

## **F. ADMINISTRATIVE STRUCTURE**

PoE was deliberately placed outside the college and school structure of the University. It reports to two deans who themselves function outside this structure: the Dean of Undergraduate Education (at present Acting Dean and Vice-Provost George Bridges) and the Dean of the Graduate School (Dean and Vice-Provost Marsha Landolt).

Day-to-day leadership is provided by two Co-Directors, initially Mike Wallace and Johnny Palka; Craig ZumBrunnen has replaced Wallace who stepped down after a three-year term in 2000. Palka will step down after a five year-term in 2002.

As envisioned by the TFEE, the Governing Board of PoE is large, consisting of some 20 members drawn from the faculty and senior professional staff of the university, as well as graduate and/or undergraduate student representatives. From the beginning it has benefited from the service of a number of serving or former department chairs. Board members are appointed to three-year terms. PoE's deans make continuing or replacement appointments from a slate of nominees presented by the Co-Directors. The Board elects its own chair via a ballot conducted by the Assistant to the Dean of Undergraduate Education, a process from which the Co-Directors are excluded. The Board has two standing committees (Personnel & Budget and Curriculum), and appoints ad hoc committees as needed.

There are four staff members: an Administrator (Terry Rustan), an Academic Services Coordinator (Michelle Hall), an Academic Counselor Senior (Gina Diamond), and a Graduate Program Coordinator (Mark Withers). Diamond's position is currently temporary due to severe financial pressures. Because the staff is so small, its members carry multiple responsibilities. For example, publications and web development have been led by Hall and Withers; course support has been provided by Hall, Withers and Rustan; service learning and capstone project support have been provided by Hall with some student assistance. Rustan covers all general administrative and fiscal duties and serves as liaison to the Board; Diamond, a recent appointee, does student advising with Hall and is taking a major initiative on recruiting. This structure is summarized in Figure 1.

## **G. DOCUMENTATION OF CONTINUING NEED**

Because PoE's B.A. in Environmental Studies is a broad-based, interdisciplinary program leading to a wide range of careers or graduate studies, it is difficult to accurately assess the ongoing need for the program as graduates take such widely varying paths. However, the Environmental Careers Organization (ECO) charts broad information on trends in a range of

# PROGRAM ON THE ENVIRONMENT

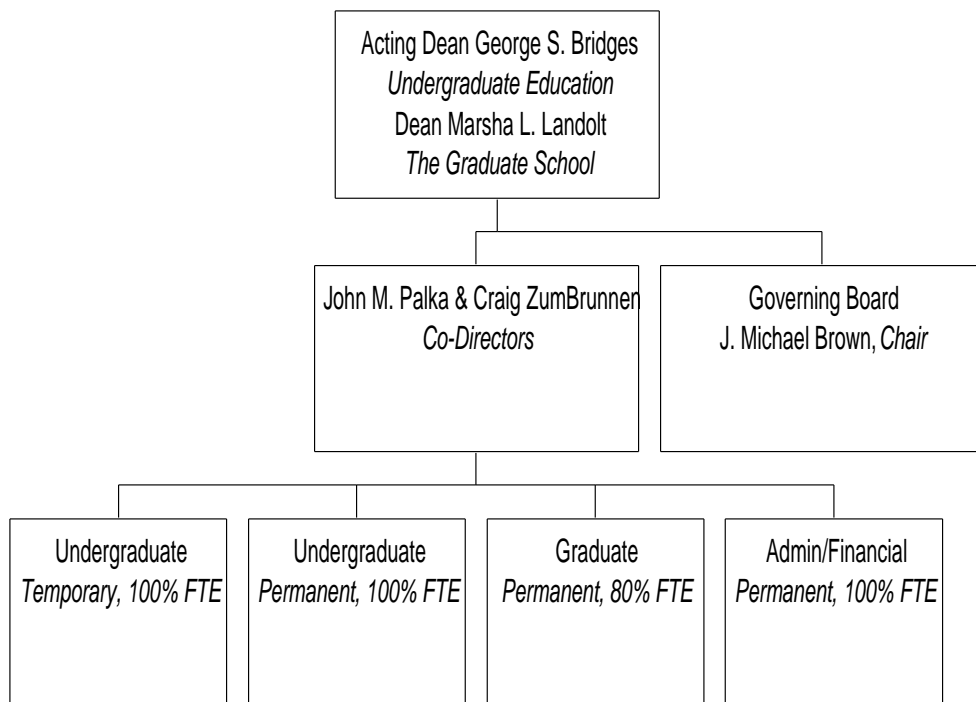


Figure 1

careers and is a useful resource for predicting the need for broad-based environmental undergraduate programs. Though trends in environmental careers are uncertain due to recent instability of the U.S. economy, ECO notes seven “drivers” in the environmental career market: regulation and legislation, liability concerns, competitiveness, entrepreneurial opportunities, citizen concerns, mergers and acquisitions, and retirements. All of these “drivers” are up or holding steady during 2001-2002, except liability concerns. Additionally ECO predicts the following “hot jobs” for the next two years: pollution prevention specialists, conservation biologists / ecosystems managers, information technology / GIS experts, “dual track” environmental managers, global climate change scientists, renewable energy and energy management experts, “smart growth” urban planners, policy integration specialists, community organizers, and fundraisers. ECO also points to state-level environmental expenditures, which are up over 200% since 1986 and grew slightly during 2001 as an important factor. Finally, ECO emphasizes that environmental careers have been in transition over the past 10 years - from pollution control to pollution prevention to the development of closed-loop and zero-emissions systems; from command and control regulatory systems, to mixed regulatory systems, to results based systems; from single species protection schemes to ecosystems management to a focus on sustainable regions. Increasingly emphasis is placed on sustainable solutions that are economically feasible, ecologically viable, and socially desirable. This ecosystems or “big picture” emphasis should bode well for broadly trained environmental practitioners.

## **H. ASSESSMENT INFORMATION**

PoE assesses the quality of student learning outcomes in ways that are driven by the learning objectives of its programs.

### **1. B.A. in Environmental Studies**

The curriculum of this degree has deliberately been designed to match the most general learning objectives both at the beginning, in the core courses, and at the end, in the capstone experience. Therefore, the principal assessment mechanisms are built into these two portions of the curriculum. Here we present as illustrations the assessment mechanisms for the first three of the eight learning objectives.

a. *Objective.* Becoming steeped in an integrated approach to environmental issues; taking courses in multiple disciplines is not enough. *Assessment.* Students participate in active learning exercises in the core courses, in which they are required to synthesize and present publicly a range of information bearing on a single issue. These presentations are a significant part of the course grade. Further, every student must complete a capstone project, write a reflective paper on the process and outcome of the project, and present this synthesis publicly. This is a highly iterative process. Credit is not given for the capstone until the student’s faculty adviser and the capstone program supervisor are satisfied with both the synthesis and the presentation.

b. *Objective.* Recognizing the cumulative nature of scientific education. *Assessment.* Environmental Studies majors are required to take basic courses in chemistry, biology, mathematics and statistics before formally declaring the major. Thereafter they must undertake at least one more advanced course in a scientific field, and they are advised to do more than that.

Many Environmental Studies majors take a concurrent degree in one of the sciences. Success in the more advanced courses is the primary measure of performance in the natural science component of the student's overall program. For those students who undertake a scientific research project as their capstone, further assessment is provided as described in (a) above.

c. *Objective.* Appreciating the legitimacy of multiple viewpoints. *Assessment.* The active learning components of the core courses stress this point, frequently requiring students working in groups to adopt and argue for stakeholder positions with which they may personally not agree. Much preparation goes into these presentations, and the performance of the students on this task is graded. The capstone projects of many students are community-based. This provides a compelling experience of the diversity of viewpoints, and an assessment of success in dealing with this diversity is a component of the assessment of the entire project by both the field adviser and the faculty adviser.

In order to take advantage of this assessment information for improving the program, the teaching faculty meet annually at a daylong retreat at which experience gained in all the capstone courses is shared and curriculum design issues are discussed. In addition, Working Groups including not only faculty affiliated with PoE but also faculty with relevant expertise but no formal connection to PoE have reviewed the capstone component of the curriculum and made suggestions for improvement. The core courses will be reviewed next year.

## **2. Graduate Certificate in Environmental Management**

The general learning objectives of this program parallel those of the undergraduate Environmental Studies major in many respects, but focus on a specific tripod of fields at the graduate level: policy, business, and the role of science in decision-making. Again, assessment mechanisms for three of the seven learning objectives are presented for illustration.

a. *Objective.* Understand the multiple values and cultural perspectives behind environmental issues confronting the modern world, nationally and internationally. *Assessment.* All the courses required of EM certificate students address this objective, so student performance in the courses is one means of assessment. In addition, the business component has taken the form of a course in which teams of students (which frequently have not only an interdisciplinary but also a multi-cultural student composition) develop marketing strategies for thus-far unexploited environmental technologies. They are required to consider the US market and at least one foreign country. Their results are presented at a quarterly symposium attended not only by diverse faculty but also by representatives of the business community who offer their critiques of the proposed strategies.

b. *Objective.* Understand the contribution that science and technology can make to the interpretation and resolution of environmental issues. *Assessment.* Several available courses address this issue and course performance provides the means of assessment. In addition, the Steering Committee has engaged in an extended process for designing a new course tailored to EM students. Students have participated in this process, thus closing the feedback loop between faculty intentions and student perceptions.

c. *Objective.* Understand the roles and capacities of the public, private and non-profit sectors, and their interactions in the real world. *Assessment.* Students are required to take a seminar series in which these interactions are specifically addressed; the series is usually organized by a professional from the non-university community. The final paper written by students on the basis of seminar presentations by an array of speakers constitutes the assessment mechanism.

The Steering Committee of this program meets frequently to discuss matters of program design and implementation. Feedback from students is an integral part of this process, as is the participation of the faculty who teach most of the courses. Thus, a mechanism for integrating learning outcomes with curriculum design is well established.

## I. NUMERICAL DATA ON GRADUATES

<b>B.A. Environmental Studies</b>			
<b>Year</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Graduates</b>	<b>2</b>	<b>10</b>	<b>12</b>
<b>Completed Capstone</b>	<b>3</b>	<b>12</b>	<b>22</b>

\*More students have completed their requirements for the B.A. in Environmental Studies than have actually graduated from the University.

<b>Graduate Certificate Programs</b>			
<b>Year</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
<b>Environmental Management*</b>	*	*	<b>7</b>
<b>Conservation Biology Policy**</b>	**	**	<b>3</b>
<b>Global and Environmental Chemistry*</b>	*	*	<b>2</b>

\* The first students from the reconfigured Environmental Management Certificate Program and from the Global and Environmental Chemistry Certificate Program graduated during the 2000–2001 Academic year.

\*\* No systematic records of enrollments and graduates were maintained prior to November 2000.

## J. PLANS TO IMPROVE THE QUALITY AND EFFECTIVENESS OF THE PROGRAM

### 1. Process for Setting Goals

PoE's goals were initially defined by the 1996 Report of the TFEE. Inasmuch as PoE was only founded in 1997, had to start by developing a curriculum and an infrastructure, and was given a complex and far-reaching mission, it has thus far relied primarily on the Report for overall guidance.

PoE has held annual Teaching Retreats since its inception. At these retreats teaching goals are discussed by the faculty and invited guests, and mechanisms for improving the course program

are sought. During 2000-2001 Working Groups, composed of PoE-affiliated faculty, staff and students as well as participants with no regular connection to PoE, reviewed major components of the entire undergraduate degree program and made recommendations for improvement. The Steering Committee of the Graduate Certificate Program in Environmental Management, which is academically housed in PoE, has reviewed the design and implementation of that program on a continuing basis. In short, there is ongoing review of PoE's teaching mission.

In addition to the teaching program, PoE has a number of other mandates. These started to be reviewed during the past academic year via several facilitated sessions including the Co-Directors, staff, and selected members of the Board. The preparation for this 5-year review represents the first major re-examination of PoE's multiple goals.

The PoE Board is now in the process of implementing an annual review of goals using the following format: The Co-directors will prepare their Annual Report, or at least a draft for Board use, by the middle of each Spring Quarter rather than during the summer as has been the practice. This report will be the starting point for a Board discussion of goals and a charge to the Co-Directors for the following year. At the next spring review, the success of the Co-Directors in carrying out their charge will be reviewed and a new charge and set of goals will be formulated.

## **2. How Might the Goals Change in the Next 10 Years?**

As it matures from the start-up phase into an established unit, PoE expects changes in the following dimensions:

- Our initial emphasis was on undergraduate education. With a strong and distinctive degree program in place there is likely to be a relatively greater emphasis on environmental education at the graduate level, and on links between undergraduate and graduate programs.
- Graduate education itself is changing nationally. It is not possible to predict with any confidence what formats will become important, what role distance learning will play, and so forth. PoE will be part of this evolution and adjust its programmatic goals accordingly.
- PoE's subject matter is nothing less than the understanding of natural and social processes and the future welfare of the planet and all its inhabitants. The leading concepts in this immensely broad but crucially important field are bound to change as scientific understanding grows, environmental conditions change, technology advances, the voices of the economically less developed nations and their peoples become more prominent, and globalization moves forward in unpredictable ways. PoE's educational goals will evolve as these major forces evolve.
- While not representing a changing goal, PoE's emphasis on engagement with the wider community is likely to grow. A substantive engagement requires a solid programmatic and institutional base, so this could not be one of PoE's early priorities even though it was discussed in the TFEE Report. Community relationships are already starting to grow; their nature is sure to change over time.

In addition to changes in the face of education and in PoE's academic field, the overall goals of PoE will be strongly affected by potential organizational changes at the University level. There has been much recent discussion of an Earth Institute and at least some revival of old discussions about possible realignments affecting the natural resource units. A merger of the Departments of Zoology and Botany and the Biology Program is already under way. The ways the distinguishing strengths of PoE can best be utilized, as well as the balance among PoE's several major activities, will be affected by whatever organizational changes are actually implemented.

### **3. Goals for the Next 5-7 Years**

Many of the goals listed below are mutually complementary. Some are relatively specific and/or achievable internally within PoE; others are more general and/or dependent on broader interactions:

- Vigorously uphold the vision of truly interdisciplinary environmental education at the entire University, complementary to but fully interactive with the strengths of specialized units. Become a model of best practices in interdisciplinary studies generally.
- Build a stronger interface with the community outside the University.
- Build a stronger interface with the environmental research programs of the University.
- Identify and implement the most strategic ways of serving the University's widely dispersed environmental community.
- Ensure that the quality of our undergraduate and graduate programs increases constantly.
- Continue to explore the best ways of structuring education in Environmental Science and Engineering, especially with an eye to appropriate links to the Master's level.
- Strengthen the role of the Board in PoE's activities and take better advantage of that fact that the Board itself constitutes a vigorous interdisciplinary community eager to advance the cause of environmental education.
- Develop a fund-raising strategy that is appropriate to PoE's mission.
- Catalyze the formation of an interactive community of scholars and students at the University itself, one that brings together diverse disciplines, generates excitement, and leads to innovative and effective approaches to education, research and service to the wider community.

### **4. Developing PoE's Potential for Academic and Pedagogical Leadership**

- PoE's undergraduate pedagogical model is nearly unique at the University of Washington with its combined emphasis on interdisciplinarity, experiential learning, and the international dimension of its field of study. For us to be seen as a leader, we must: (a) ensure that quality is not sacrificed for the sake of breadth; (b) work to attract growing numbers of excellent students; and (c) make the program more widely visible.
- PoE is already a nucleus around which interdisciplinary environmental programs cluster. Leadership will be based on (a) providing the best possible support for these programs; (b) fostering interactions among them; (c) helping to improve their quality

and their reach within the University; and (d) making the cluster as a whole increasingly visible.

- Interdisciplinarity always rests on a foundation of disciplinary expertise. PoE must constantly examine and refine the complementary relationship of its interdisciplinary programs to the many disciplinary programs on which the intellectual strength of the University is based.

### **5. How Could the University Assist Us?**

- The University is publicly committed to the value of interdisciplinary studies. Nevertheless, there is a widespread internal perception that faculty and units who emphasize interdisciplinary work are in competition with those who focus on more traditional, discipline-based approaches. The development of specific mechanisms for “crediting” units whose faculty participate in interdisciplinary programs would be extremely helpful.
- As an interdisciplinary program, PoE faces many administrative barriers such as difficulty in cross-listing courses across more than two programs, inadequate support for creating appropriate course evaluation mechanisms for team-taught courses, and the lack of a method equivalent to student credit hours by which PoE can document its course and teaching activities. University assistance in mitigating these barriers would be of service to all UW interdisciplinary programs.
- Because of the extremely difficult overall budget situation, there is an increasing emphasis on seeking private funds. PoE is prepared to undertake such efforts as well. However, because of the contentious nature of many environmental issues it is in a particularly delicate position with respect to external funders and even the constitution of an External Committee. PoE must, first and foremost, be seen as neutral and even-handed in its approach to the issues and in the relationships it develops. Neither a particular ideology nor the differential availability of financial resources among different stakeholders can be allowed to influence PoE’s relationships with the wider community. University assistance in constituting an appropriate External Committee and in designing a fund-raising effort will therefore be of great value.

## II. SELF-EVALUATION

### A. UNIT ROLES, STRENGTHS, ACCOMPLISHMENTS

#### 1. ROLES

PoE was established on the basis of the Report of the Presidential Task Force on Environmental Education (TFEE). The Report set forth a broadly conceived Vision Statement of environmental education, emphasizing interdisciplinarity and the importance of integrating scientific perspectives with those of social sciences, law, policy and other fields outside the natural sciences.

In addition, the Report recommended a five-fold mission for the new environmental studies unit (now PoE): (a) develop an undergraduate degree program in environmental studies; (b) help “infuse the environmental dimension” into the curricula of all units; (c) establish reciprocal relationships with non-UW organizations engaged in environmental matters; (d) establish a flexible institutional framework for environmental studies; and (e) promote a cultural shift toward interdisciplinary studies across the institution. The full text of the Vision and Mission Statements is found in Sects. II.A and II.C of the TFEE Report ( App. H).

It is evident that PoE was challenged with an enormous overall task at the time of its creation. At the same time, the President and the Provost made it clear in conversation and by letter that the creation of an undergraduate degree program was to be the first priority. Further, Alvin Kwiram, Vice-Provost for Research, wrote a provocative analysis of the history of efforts to integrate environmental science programs at the UW, including the work of the TFEE. He concluded that what the Task Force had recommended was primarily an educational unit, not a unit well designed to handle the institutional task of coordinating the richly diverse research programs of the environmental sciences.

In the barely five years since the first Co-Directors were appointed in Spring Quarter, 1997, PoE has developed into an organization with notable strengths, received strong support from the Administration, faced numerous obstacles, accomplished significant portions of its overall charge, and moved in some directions not anticipated by the TFEE. It has evolved partly in the way Kwiram predicted from the TFEE Report, as a unit focused on education, and partly as a unit that delivers many services to the UW environmental community that neither the TFEE nor Kwiram could have foreseen.

#### 2. STRENGTHS AND THEIR INDICATORS

a. *Serves a vision* that is unique at the UW but is in full alignment with the TFEE Report as well as major national and international documents (e.g. *Our Common Journey: A Transition toward Sustainability*). This vision is one of broadly interdisciplinary study of environmental issues that are vital to the long-term sustainability of human and ecological well-being on all scales, from local to global, with a strong component of science but full incorporation of many other disciplines.

b. *Has developed a breadth of connections* across UW that is detailed in Sect. IV but can be indicated by two numbers: direct participation in PoE activities by over 100 faculty from at least 35 schools and departments from all three campuses of the University.

c. *Is a catalyst* for synergistic interdisciplinary environmental initiatives exemplified by:

- Redesign of Environmental Management Certificate Program.
- Establishment of Restoration Ecology Network.
- Collaborative development of bi-national program on Puget Sound/Georgia Straits.
- Proposal for adoption of UW Sustainability Policy.
- Collaborative support for IGERT program in Urban Ecology.

d. *Has a committed Board*:

- In the earliest days of PoE the Board actively helped to shape the design of the curriculum and the core courses.
- Starting last year the Board has undertaken, with renewed energy, to be an active participant in PoE's mission rather than largely an oversight body.

e. *Has an outstanding staff*:

- PoE is in many respects a service unit and depends on the quality of its staff.
- The staff has shown great imagination and initiative in service to the entire UW environmental community as well as PoE; one outstanding example is the establishment and continued leadership of the Environmental Advising Group (EAG) (Sect. 5 below).

f. *Provides a home and/or staff support* for interdisciplinary environmental programs:

- Graduate Certificate Programs in Environmental Management, Conservation Biology Policy, and Global and Environmental Chemistry - already in place.
- Restoration Ecology Network – proposed.
- Graduate Certificate in Science Policy Dimensions of Earth Sciences – proposed.

g. *Serves as an information node* for environmental studies at UW:

- Establishment and leadership of Environmental Advising Group for efficient sharing and distribution of environmental program-related information across the University.
- University-wide brochure and matched website identifying and linking to all undergraduate environmental programs developed by EAG (parallel data for graduate programs currently being collected).
- Academic Services Coordinator who regularly collates and distributes information on environmental programs, courses, careers, volunteer opportunities, and events to other environmental undergraduate programs, to undergraduate student organizations, to UW advisers at all three campus, and to representatives from regional community colleges.
- Graduate Program Coordinator who similarly collates and distributes information of interest to graduate-level interdisciplinary environmental programs and student organizations.

- A directory of UW faculty with environmental expertise, periodically updated and available on the PoE website. This was originally part of a collaborative effort with a number of other institutions in the region led by Clark Gaulding at the EPA under the title G.A.T.E. Northwest.

h. *Provides an inclusive and safe forum* for discussion of environmental issues:

- PoE is increasingly asked by outside organizations such as the World Affairs Council to organize discussions on diverse environmental themes.
- Several graduate student organizations take advantage of PoE space and staff support to hold seminars.
- Faculty have organized a number of lecture series under PoE auspices.
- Faculty frequently bring new curricular ideas to PoE for discussion, for example, the recent initiative of Professor Tim Nyerges for a curriculum on sustainability.

### **3. ACCOMPLISHMENTS**

#### **a. Accomplishments in Relation to TFEE Mission Components**

Some of PoE's accomplishments are listed above to illustrate what is meant by the phrases indicating strengths. Here we list accomplishments related specifically to the points of the TFEE Mission Statement:

- Establishment of a comprehensive B.A. in Environmental Studies. Its high quality is indicated by (a) the utilization of its core courses by two of the UW's best undergraduate units, Honors and International Studies, and (b) by the recent surge of requests by Honors students for the establishment of an Honors Program within Environmental Studies.
- The "infusion of the environmental dimension" into many units, primarily by successful partnering in the appointment of new, unit-based faculty, financial support of environmental courses within units, and participation in major grant proposals that bring new faculty and funds to units. Many details are presented in Sect. IV, Relationships with Other Units.
- The establishment of working relationships with many organizations outside the UW, primarily through the service learning and capstone components of the B.A. This is the first step in implementing PoE's goal of setting environmental education in a wider societal context.
- Substantial contributions towards developing an institutional framework for interdisciplinary environmental studies at the curricular level include: (a) Establishment of a very large network of faculty across all three campuses who share PoE's vision and participate in its teaching, discussions and governance, and (b) PoE's success in providing organizational support for both established and new interdisciplinary environmental programs.
- Changing institutional cultures is a daunting task, but the enthusiasm of the faculty who have worked with PoE in various capacities shows that it has indeed encouraged and provided an attractive venue for interdisciplinary studies and teaching. Beyond that, PoE has been consulted numerous times by faculty and units who themselves are

seeking to move in interdisciplinary directions, indicating that PoE's "cultural" influence extends beyond the large number of faculty who have worked with it directly.

**b. Accomplishments in Areas Not Envisioned by the TFEE:**

- Productive linkages to the University's new campuses including partnering on faculty appointments, Board membership, core course teaching, development of recruiting and informational materials, and PoE support of tri-campus efforts such as the Restoration Ecology Network.
- The evolution of a strong international component in the B.A. curriculum that links directly to the University's thrust in international studies.
- Campus-wide coordination of advising and recruiting for a large number of different environmental programs at the undergraduate level.
- Coordinated support given to an array of independently-designed graduate-level programs.

**4. ROLE AS A CATALYST**

A small unit with no faculty can exert its greatest institutional impact when it acts as a catalyst for activities that are actually carried out by others. PoE has done this in many ways whose cumulative effect is substantial. Its ability to act as a catalyst is based on the very widespread network of supportive relationships that is detailed in Sect. IV.

A few illustrative examples of institutional catalysis are presented here to give a flavor of the process.

*a. Policy on Environmental Stewardship and Sustainable Practices at the University of Washington.* During 1999-2000 the PoE Co-Directors met with the Director of the Capital Projects Office to explore the feasibility of developing and implementing an institutional Environmental Policy at the UW. Following his positive response, an *ad hoc* group of faculty, staff and students, assembled by word of mouth, met and produced a draft policy submitted for discussion to the President, Provost and other members of the higher Administration. Executive Vice-President Weldon Ihrig appointed an official task force to study the issue; the report of the task force is now in his hands and being examined for implementation. This was not an official PoE project, but the Co-Directors played an important role in initiating it, and all of the faculty participants in the *ad hoc* group and those who were appointed to the task force, as well as the major student participants, were associated with and frequently knew each other through PoE.

*b. Bi-national, tri-institutional course on "Puget Sound/Georgia Basin: Managing an International Ecosystem".* The catalytic spark for this course, which promises to become the core of a major program, took this form: PoE's Graduate Program in Environmental Management was seeking a coordinator for a seminar course. One of the Steering Committee members (whom, incidentally, PoE had assisted in hiring) suggested advertising outside as well as inside the UW. The best proposals came from research staff at National Marine Fisheries and at the Battelle Institute. The NMFS proposal was selected, but the Battelle proposal was taken to the Canadian Studies Program at the Jackson School. Canadian Studies took it forward in the

form of a course and lecture series, while PoE provided the salary for the instructor. The event was immensely successful both for the students and for the many faculty, public officials and stakeholder representatives from both countries who participated (see App. N-2), and funding is being sought to support its continuation.

*c. Graduate Educational Partnership with Puget Sound Environmental Learning Center.* PSELC is a new residential center aimed at children, primarily in the Seattle School District, who would otherwise have no opportunity to study the environment in a natural setting. One of its goals is to train environmental educators in a way that can be interfaced to a university Master's program. The Chair of Landscape Architecture, a long-time associate of PoE and now a member of its Board, recommended to PSELC that it contact PoE to see if such a link at the graduate level could be facilitated. Over time this was accomplished through the M.S. in Biology Teaching Program housed in the Graduate School and, in parallel, with the Masters Program in Science Education in the College of Education. An MOU defining the academic relationship between PSELC and the UW was signed recently. An additional outcome of this process has been that the M.S. in Biology Teaching has expanded its vision from an emphasis exclusively on the laboratory aspects of biology to include environmental studies as well. A new working relationship with a community partner has been forged, and the graduate training of teachers in environmental studies has been enabled through a process in which PoE played a catalytic role.

*The essential characteristic of a catalyst is that it enables a reaction to occur but is itself neither a reactant nor a product of the reaction. These examples, and numerous others, illustrate how PoE plays just this kind of catalytic role at the UW, often being appropriately invisible in the process.*

## **5. SERVICE TO THE UW ENVIRONMENTAL COMMUNITY - UNDERGRADUATE**

### **a. Environmental Advising Group**

PoE spearheaded the formation of the Environmental Advising Group (EAG) in 1999-2000. The units participating in this group include Aquatic and Fishery Sciences, Atmospheric Sciences, Biology/Botany/Zoology, Community & Environmental Planning Earth & Space Sciences, Environmental Health, Forest Resources, Geography, and Oceanography in addition to PoE. The Group has two principal goals: (a) To share information about programs so that the best match between student and program can be facilitated; and (b) To recruit actively on behalf of all environment-related programs at the UW. Many of these programs have seen declines in enrollment over the past decade, often as part of a national trend, so recruiting is a significant issue for them.

*University-Wide Brochure and Website.* The major tangible accomplishments of the Environmental Advising Group have been the production of a recruiting brochure that serves all three campuses of the UW (App. I-1), and the development of a website that is based on this brochure ([www.environment.washington.edu](http://www.environment.washington.edu), App. I-2). The idea for the brochure came from the group, which also assisted a PoE Adviser in collecting all the necessary information and in writing the general text. UW Tacoma provided layout design gratis, and PoE paid for the printing as well as the large-scale mailing (~3,500 copies) to every community college in Washington

State and to all Western Washington high schools that took place in summer, 2001. Free copies in significant numbers have been provided to units including all environmental undergraduate programs, the UW Office of Admissions, the Gateway Undergraduate Advising Center, the Office of Minority Affairs, and various other service units. The brochure was also distributed widely during summer, 2001 UW Freshman and Transfer Orientation sessions. *To the best of our knowledge, no such institution-wide efforts involving environment-related units have ever taken place before at the UW.*

*Environmental Opportunities Fair.* In addition, the Environmental Advising Group organized the first-ever Environmental Opportunities Fair that took place in Autumn, 2001. Approximately a dozen non-UW organizations participated, in addition to over 20 units from UW Seattle plus representatives from UW Bothell and UW Tacoma. (App. I-3). Students and faculty from seven high schools and three community colleges attended the fair in addition to large numbers of students and faculty from the University. Plans are already under way to repeat the event next year. Various units have held career-oriented public events in the past, but this is the first time that unit efforts have been pooled to serve the environmental community in a unified way.

*Shared Recruiting.* Finally, the Environmental Advising Group is sharing recruiting efforts. With the brochure and website in hand, advisers are going out to community colleges, high schools, and professional meetings representing the UW as an institution, in addition to their own units. PoE advisers have created a recruiting kit including "Study the Environment" materials and specific program information on all undergraduate environmental degrees and have made the kit available to any adviser for recruiting visits and events. To avoid duplication of effort, PoE advisers lead quarterly Collaborative Recruiting Committee meetings in which advisers divide the task of visiting top community college feeder schools, coordinate visits to 100 and 200-level environmental courses, and, most recently, schedule combined information sessions on a range of environmental programs to assist students with gathering information on several related majors at once. A PoE adviser has created a PowerPoint presentation highlighting the eight different programs featured in the Information Sessions, so that any adviser can lead a session using the same presentation.

*Collaborative Spirit.* Underlying all these activities is the most important element of all, a wholly new collaborative spirit among the student services staffs of all the participating units. This is evident in letters written to PoE (App. I-4), and also in the initiatives taken by various members, not just the ones from PoE. Here as an example is the first paragraph of a recent e-mail about a proposed new joint venture from the Environmental Health member of the group:

Hello everyone! I had a meeting with Jim Rawlins from Admissions this morning, and he presented a very interesting opportunity for us. The UW Admissions office now has the capability to host online open houses for admitted freshmen who are interested in specific programs. Basically, the "open house" is a chat room where students can come in and ask questions or just watch the discussions taking place on specific majors. Jim mentioned this opportunity to me, since I have been working with him on other recruitment issues, but we both agree that this is a great opportunity for the environmental programs to pool our

recruitment efforts, much like our collaborative information sessions. Plus, we will most likely have a greater turnout with more majors. Admissions did this with the Honors Program earlier this week, and it was a huge success that the UW participants found very rewarding.

Effective collaborations are built on trust, and this extract, together with the letters in App. I-4, shows the extraordinarily high level of trust and sense of mutual support that the Environmental Advising Group has been able to develop. *We consider this to be a major achievement that contributes directly to the mission of PoE to coordinate environmental teaching efforts, and to be especially notable because it was not foreseen by anyone in the planning stages of PoE. It came from the initiative of a dedicated staff member supported by the collaborative ethic that pervades PoE.*

#### **b. Service Activities of PoE's Academic Services Staff**

In addition to coordinating the Environmental Advising Group, PoE's two undergraduate advising staff members also participate in a range of service activities.

*Service to the UW community.* PoE's undergraduate advisers manage several list serves of value to the larger UW community including the Environmental Studies student list serve, to which all PoE majors and minors and many students from other majors subscribe in order to receive regular announcements on environmental courses, programs, events, internships, and volunteer and career opportunities; and the Environmental Advising Group list serve, to which active members of that group subscribe and use to share information, but to which other UW faculty and staff subscribe to learn about events and program updates. PoE advisers also manage an email account connected to the "Study the Environment" website in addition to a PoE Advice email account used to communicate with prospective majors and minors and with other advisers.

Additionally, PoE undergraduate advisers play a leadership role in several campus-wide student services events. PoE advisers are leaders in coordinating advising sessions for summer Freshman and Transfer Orientation by updating the environmental majors group presentation and supporting materials. PoE advisers also regularly participate in the planning for the annual UW Career Week. For the 2002 Career Week, PoE hosted five workshops on environmental careers, and Academic Services Coordinator Michelle Hall co-presented a session on "Environmental Career Trends" with the Environmental Careers Organization and facilitated an alumni panel on "Environmental Education and Advocacy Careers."

PoE undergraduate advisers are also regularly tapped to serve on UW committees and to participate in leadership activities. Hall was selected to serve a two-year term as one of six board members for the UW Association of Professional Advisers and Counselors (APAC), which represents the more than 200 UW advisers in all campus units. Hall's nomination was the result of her recognized leadership within the Environmental Advising Group, and her service includes the publication of a quarterly APAC newsletter highlighting campus-wide advising activities and events, the maintenance of the APAC website and email account, and the publication of the APAC brochure. In the past, PoE undergraduate advisers have also been invited to participate in grant-writing initiatives, to provide training on experiential learning, to serve on planning

committees for events such as UW's International Week, and to serve on undergraduate scholarship review committees.

*Interactions with Undergraduate Student Groups.* PoE's Academic Services Coordinator serves as the staff adviser for two student organizations: the newly developed Environmental Studies student organization, which will be launched during spring 2002 and the UW Earth Week chapter, which plans campus Earth Week events and includes representatives from a variety of student organizations in units such as Forest Resources and Community & Environmental Planning, and the Graduate Environmental Policy Forum. This year's Earth Week will include the fullest schedule of events since the first UW Earth Week was held three years ago, including an Earth Fair, an Energy and Transportation Fair, a keynote speaker from the Natural Resources Defense Council (NRDC), and an environmental art contest.

*Service to the broader community.* To support and build PoE's Capstone Experience program and Service Learning course sections, PoE undergraduate advisers maintain close contact with nonprofit environmental organizations and government agencies that serve as sites for capstone student internships and projects and network with potential capstone host agencies to develop new site placements. Advisers are also frequently invited to present at events such as a spring 2001 career fair at an area high school that reached over 500 students interested in environmental careers.

PoE undergraduate advisers are clearly viewed campus-wide as a valuable resource for information on environmental degree programs, courses, and careers. Moreover, they are active in service that extends beyond their environmental expertise and the University campus. They provide emerging collaborative programming and leadership involving students, staff, faculty, and alumni across the university.

## **6. SERVICE TO THE UW ENVIRONMENTAL COMMUNITY - GRADUATE**

### **a. Graduate Program Coordinator**

During 2000-2001 the Dean of the Graduate School, Marsha Landolt, proposed that a new staff position be created for the support of all Graduate Certificate Programs dealing with environmental issues. The cost of the new position would be shared 50:50 between the Graduate School and PoE, and the new Graduate Program Coordinator would be physically housed in PoE. The goal was to provide integrated support for these programs by a person with advanced academic training in an environmental field. The PoE Board accepted this proposal and Mark Withers was appointed to the position in Autumn, 2001. This has made possible a number of improvements in the support of interdisciplinary environmental efforts at the graduate level.

*Staff Support of Graduate Certificate Programs.* The Graduate Program Coordinator provides staff support (recruiting, advising, tracking student progress, organizing steering committee meetings, keeping minutes and other records, developing and/or maintaining websites, etc.) to three certificate programs: Environmental Management (EM), Conservation Biology Policy (ConBio), and Global Environmental Chemistry (GEC). The latter two remain

academically housed in the Graduate School, but in terms of staff support this is immaterial. The quality of support has been greatly improved, there is cross-talk among the programs and their students, the size of the ConBio program has approximately doubled to 15. Clearly this is a rational and productive way to support these certificate programs.

*Interactions with Graduate Student Groups.* Several graduate student groups have developed informal affiliations with PoE through contact with Withers: the Graduate Environmental Policy Forum (GEPFa) based in the Evans School of Public Affairs, the Environment and Society Interdisciplinary Forum (ESIF) based in Anthropology and Forest Resources, NetImpact in the Business School, and GreenLaw in the Law School. The links of these groups to PoE consist of information sharing, shared publicity for lectures and other events, announcements about courses, etc. Withers actively assisted the initial organization of ESIF, which continues to meet in PoE space. Finally, he puts out periodic newsletter containing information about courses, conferences and other matters of interest to graduate students interested in interdisciplinary environmental studies.

With respect to the broader community, Withers has taken on keeping the Conservation Biology Job Listserve; has represented the UW on the Academic Committee of a major North American Wilderness Conference that is planned for May, 2002; was recruited to serve on a panel at the national conference of the association of Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS); and, like Michelle Hall, has been active with the Environmental Careers Organization, a large national organization through which the link to MANRRS came about.

In every way, then, the Graduate Program Coordinator supports graduate environmental efforts that cross disciplinary boundaries, irrespective of what units are involved. Thus, his service extends substantially beyond what was envisioned when his position was created. Assessments of the quality of his work, both from a faculty and from a student perspective, are provided in App. J, and many further details of his services appear in Sect. VI in which the individual Graduate Certificate Programs are described.

## **b. Compendium of Graduate Environmental Programs**

Through the Coordinator, PoE is preparing to take the first steps toward a university-wide publication and website at the graduate level parallel to what has already been produced for undergraduate programs. This effort would collate information and make it available in one place. It would not by itself constitute program coordination. Nevertheless, it would clearly be a useful institutional step to describe in a single location programs that are widely dispersed across many departments, schools and colleges, and we expect that units will be supportive of this initiative.

## **B. PERFORMANCE CRITERIA, PEERS**

### **1. IDENTIFICATION OF PEERS**

Environmental education is organized in many different ways at peer institutions, so it is difficult to establish comparisons for PoE as a whole. Comparison is easier for PoE's B.A. in Environmental Studies. Comparisons within the UW for the whole of PoE are difficult, again because PoE has an unusual mission. In terms of just the undergraduate degree, the unit most similar to PoE is probably the Honors Program. Its students take core courses that are offered by Honors itself and are distinguished by their breadth; complete their course work in units across the University; and in most cases are required to do independent work that is parallel to the PoE capstone requirement.

For comparison of unit organization, we examined programs at Yale, Michigan, Stanford, Oregon and Tufts:

- Yale and Michigan: Each concentrates environmental education in a single school with a long history of dealing with natural resource issues on a primarily scientific and economic basis. These are outstanding schools and major units in their universities. They appear to have limited formal links to other units, but it is notable that *both have established Environmental Studies degrees not unlike PoE's B.A. within the past few years.*
- Stanford: The University supports multiple units dealing with environmental issues; there appears to be no unit with as sweeping a mandate as PoE. Several degrees are interdisciplinary but all have a very strong science focus, even when linked to law and economics. These programs are great models for discussions concerning Environmental Science at UW that PoE is spearheading as well those concerning potential interdisciplinary environmental Ph.D. programs led by Prof. Ed. Miles.
- Oregon: Offers B.A., B.S., MS and Ph.D. degrees in Environmental Studies and Environmental Science. There is a sharp distinction between the B.A. (focusing on social sciences, policy studies and the humanities) and the B.S. (which is interdisciplinary only within the sciences), though the B.A. does require substantial lower division work in the natural sciences. The administering unit focuses on the degrees and does not have the institution-wide focus of PoE.
- Tufts: The Environmental Studies Program at Tufts resembles the undergraduate degree component of PoE fairly closely, though the way it partitions the field into tracks is quite different and it requires, rather than merely encouraging, a second, disciplinary major. It does not offer its own courses, whereas team-taught core courses are one of the hallmarks of the PoE curriculum. The relatively new Tufts Institute of the Environment (TIE) is specifically designed to catalyze and support research efforts, something that PoE has not done in a direct way and for which its structure is not optimal. Limiting the comparison is the fact that Tufts is a relatively small, private institution.

A number of other organizational models exist at other major research universities. On the one hand, the diversity of organizational models indicates the challenge of mobilizing in a single coherent way all of a large institution's environmental expertise. On the other, it reflects the rich, creative ferment as institutions long structured along familiar disciplinary boundaries grapple with the reality of an ever more complex world in which the cutting edge educational and research questions are increasingly problem-based rather than discipline-based.

## **2. PERFORMANCE CRITERIA**

Given these complexities, what are some reasonable criteria by which PoE could be evaluated at the present time?

- Has PoE been true to the recommendation of the TFEE that it be a facilitating unit rather than a unit that builds its own domain? The ways in which PoE's work is based on collaboration and facilitation are described in detail in Sect. IV, Relationships with Other Units.
- Has PoE developed an excellent undergraduate degree program, the first of its designated missions? The degree program, criteria for evaluating it, and data relevant to those criteria are presented in Sect. VI, Degree Programs.
- Has PoE been creative? The TFEE could not foresee all opportunities or obstacles that PoE would encounter. Has PoE taken advantage of opportunities and dealt successfully with obstacles? This self-study identifies a number of unforeseen activities and approaches throughout the text.
- Has PoE been cohesive? The tendency to divide internally along lines of disciplinary perspective or ideological stance has been identified as one of the major pitfalls to which Environmental Studies programs are prone. Has PoE been able to cultivate a truly collaborative spirit internally, as well as with other UW units? True collaborativeness has been one of PoE's principal goals and is documented throughout this self-study.
- Has PoE been able to develop productive linkages with the wider, non-UW community? The principal existing linkages are to service learning and capstone sites and a relatively small number of major service and professional organizations. Far more remain to be developed.

## **C. WEAKNESSES**

### **1. AREAS UNDER IMPROVEMENT**

- PoE has always had an outstanding and supportive Governing Board but has not taken full advantage of its potential. We are now exploring ways to strengthen the role of the Board, take better advantage of the experience and perspectives that Board members bring, and increase the clarity and transparency of all PoE decisions and initiatives.
- During its start-up phase, while the undergraduate degree program and PoE's own infrastructure were being built from scratch, we focused on developing close working relationships with many individual faculty members including numerous chairs, but relatively few whole units. This has limited PoE's institutional impact. We have recently begun to explore how to work more effectively at the unit level without abandoning the grass-roots quality on which PoE's success to date has been based.
- PoE has long debated but not yet acted on establishing an External Committee representing important constituencies. In order to maximize its community impact, as

well as create an opportunity to raise private funds, we have started to work with the Office of Corporate and Foundation Relations to clearly define the mission of the External Committee and proceed with its appointment.

- PoE has a great many accomplishments to its credit, but it has not made them very visible. This limits the value that others see in PoE's overall effort and in some cases (e.g., service as an information node) limits the value of the work itself. We are taking some internal steps, such as a much-improved website which should be ready in early Spring Quarter, to increase the visibility and usefulness of PoE's service within the University and beyond.
- PoE's student tracking systems, which are particularly important in view of the flexibility of our degree structure, have been thorough but cumbersome and time-consuming. We have been developing an integrated internal database, which should be complete by the end of the academic year and yield much operational efficiency, allowing the Advisers to focus more on academic services, both within PoE and institution-wide.

## **2. CHALLENGES/OBSTACLES**

- PoE was asked to develop its own major while also supporting existing majors, at least three of which had suffered long periods of decline in student numbers and were concerned that PoE might compete with them and cause further erosion. This challenge was met successfully, partly by meeting with unit curriculum committees but primarily by the establishment and productive work of the Environmental Advising Group described above.
- PoE was asked to focus on what units were not already doing, first and foremost on fostering an interdisciplinary approach to environmental studies. There is a classic tension between disciplinary and interdisciplinary programs, based on judgments about what constitutes excellent education and exacerbated in times of financial difficulty such as we are facing now. PoE's own work is thoroughly interdisciplinary, and therefore subject to the classic debates. Our challenge is to make the true value of interdisciplinarity as a complement to disciplinary studies compellingly apparent.
- There is a tendency to accord primacy to the natural sciences. PoE is both mandated and committed to supporting all fields that are relevant to the understanding and resolution of environmental problems and thus faces the criticism that its curriculum does not provide the expertise associated with a science program. While PoE has facilitated discussions about an appropriate approach to Environmental Science for some time and is optimistic that these will be fruitful, it considers its broad reach across all fields to be a strength that should be applied creatively even when science is the focus. The challenge is how to actually implement this vision at a high standard and to the satisfaction of science units.
- PoE's overall mandate was so broad that inevitably portions of it have remained unfulfilled, leaving PoE open to criticism. This requires a sharper definition of PoE's role in the institution.

## **3. FUTURE CHALLENGES**

- The fundamental challenge is contained in the last point above, a sharper definition of PoE's institutional role. It is significant that even at the time of PoE's founding there

was a discrepancy between the sweeping vision contained in the TFEF Mission statement and the primarily educational focus of the full document, an important point recognized in the white paper by Kwiram. Many organizational changes and re-alignments are now taking place at the University, and the challenge will be to participate in these in such a way that PoE's greatest strengths (breadth of reach, true collaborativeness among diverse faculty and staff based on positive interactions and trust, shared vision of the societal importance of an integrated view of environmental issues) can make the greatest contribution. These strengths are intangible, not measurable in dollars or student credit hours, but difficult to achieve, precious, and capable of making profound contributions if used effectively.

- Linked to a sharpened definition of mission is the question of PoE's leadership structure. To launch PoE, two half-time Co-Directors were appointed because the task seemed so daunting that neither one was willing to undertake it by himself. When Wallace stepped down, as planned, at the end of a three year term, ZumBrunnen was selected to take his place. However, it has not been clear that Palka will be replaced at the end of his five-year term. It is not possible for one person to carry full leadership of PoE on a half-time basis, and PoE has not had an Associate Director, as do programs such as Honors and Biology. It will be essential to clarify PoE's leadership structure as it moves forward, even into the next academic year. Proposals based on a more active and creative use of the Board are now being developed.

## **D. RESPONSES TO A CHANGING ACADEMIC ENVIRONMENT**

PoE's history is too short for most of this section to apply as normally intended. On the other hand, many changes in teaching, research and service that occurred in the decade prior to the establishment of PoE have strongly influenced both the conception of PoE's role and its structure.

**1. The rise of interdisciplinary education and research worldwide.** The new emphasis on interdisciplinarity has resulted from the recognition that (a) major contemporary problems from the local to the global do not fit within the knowledge domains of common traditional disciplines and (b) complex methodological approaches to address these problems are beyond the standard toolkits of single disciplines.

- PoE fully embodies the rise of interdisciplinary studies.
- All of PoE's core courses are by conscious design interdisciplinary and taught by two to four faculty members from different natural science, social science and humanities departments.

**2. Globalization processes and global environmental problems,** such as over-fishing, human population and health problems, pollution, and global climate change have fostered a critical need for more international curricula almost regardless of field.

- PoE is actively developing an international dimension to its curriculum and assisting with the development of “environmental dimensions” in other international programs.
- PoE has partnered with the International Studies Program of the Jackson School of International Studies (JSIS) to provide JSIS with core courses for their new “environmental track” within International Studies and in return to identify JSIS IS courses that would be taken by PoE majors in PoE new international track option.
- PoE is actively involved in developing an International Track for its undergraduate students whose signature will be a minimum of one quarter of international fieldwork, course work, or Capstone research experience. This option should be available to students beginning Autumn, 2002.
- PoE will be offering a new course as part of collaborative Hewlett Foundation funded Global Classrooms Project.
- PoE has partnered with JSIS Canadian Studies Program in developing an impressive bi-national course in collaboration with the University of British Columbia and Western Washington University.

**3. Movement from a focus on passive knowledge transfer to active learning,** leading to a classroom that is more experiential, research-oriented, student-centered and student-driven.

- Experiential learning has been a mainstay of the PoE curriculum from its inception.
- All of PoE’s core courses involve student researched, interdisciplinary case studies.
- One of the signatures of PoE’s undergraduate program is its yearlong suite of Capstone seminars required of all students.

**4. A new spotlight on the role of human values, ethics, human agency, and social processes** as crucial factors to any understanding of global environmental problems.

- PoE has collaborated with Philosophy on the development of the successful Values in Society UIF proposal.
- PoE has long given TA support to an Environmental Ethics course.
- PoE has supported courses in Environmental Literature.
- PoE has supported the development and offering of a non-majors course in Environmental Economics.

**5. Technological changes,** especially in terms of the rise of the Internet and communication and information technology (CIT) have had profound impacts on the questions we study, how we study them, and how we generate, validate and transfer new knowledge.

- PoE is nearing completion of a major rebuilding and restructuring of its Internet resources that will significantly expand PoE’s role as a major environmental information node.
- PoE new Global Classroom class will be Internet mediated and involve distance learning.
- PoE hosted “A Conversation to Explore Collaboration in IT (Information Technology) and Sustainable Development” initiated by Judith Lundberg, President of Global Sovereignty, Seattle. This international workshop on the role of CIT in

international capacity building for environmental management and poverty alleviation brought Dr. Pachauri, the Director of TERI (Tata Energy Resources Institute), New Delhi, India, and Dr. Dr. Maurer of Graz University, Austria to UW. As a result, Global Sovereignty, PoE, the UW Geography Department, TERI, and Graz University partnered in a proposal for test-beds and international educational forums that would allow each partner to collaboratively participate in international community-based environmental science and policy work through cross-institutional teams focused on multidisciplinary interagency collaboration related to sustainable resource planning, resource management, and resource development. Long term benefits would include graduate research, professional development, and curriculum development as well as international, interdisciplinary, cross-cultural, and cross-institutional support that benefits community decision makers and stakeholders as clients.

All of these significant broad changes have impacted PoE and been infused thoroughly in what PoE does and how PoE carries out its multifaceted missions.

## **E. OUR VIEW vs. COLLEGE AND UNIVERSITY VIEWS OF PoE**

### **1. Full Range of Contributions to Environmental Education**

PoE has written, and distributed widely, meticulous Annual Reports, and also annual letters to chairs, directors and deans in which their units' interactions with PoE have been detailed. Feedback has rarely been received except from the President and our own deans, and that has always been very complimentary. Despite these efforts, it now seems apparent that a comprehensive picture of how PoE operates and how much it contributes, especially in the catalytic and service roles described above, has not been successfully communicated. This may lead to an underestimation of PoE's effectiveness.

### **2. Research Aspect of Mandate**

PoE was originally given a mandate that was extremely ambitious relative to the structure that was set in place and to the educational mission that was clearly the first priority of both the TFEE Report and of the Administration. This is especially evident in the area of research.

PoE has contributed to the UW's interdisciplinary environmental research effort substantially but indirectly - through supporting the appointment of faculty who have developed successful research programs; through the work of students and faculty involved in the various interdisciplinary programs that PoE houses and/or supports; and through the success of a number of large funding proposals involving interdisciplinary research in which PoE has been a partner. However, PoE has not attempted large-scale integration of environmental efforts across the institution.

It is our view that PoE is not well structured to support major research initiatives in a way that would be attractive to an entrepreneurial faculty. Research projects already readily cross

disciplinary lines. For example, the UW has had notable success with IGERT grants, a good measure of the readiness of faculty to enter into collaborative research and graduate training programs. The main obstacles tend to be administrative ones that an academically focused unit like PoE cannot deal with. PoE can play a supporting role in a variety of ways. Examples include: (a) linking graduate/research efforts to undergraduate education as it has done, for example, in the IGERT Program in Urban Ecology and is starting to do through its evolving collaboration with the Puget Sound Regional Synthesis Model group (PRISM); (b) linking external organizations to UW expertise across a wide range of domains, both disciplinary and interdisciplinary; and (c) linking academic expertise to university operations, as in its indirect role in the development of a UW Environmental Policy. These are all research-based activities in which PoE's distinctive contribution is reaching across disciplines; they are already in progress but can be significantly expanded. However, it is appropriate to explore whether PoE should be asked to do more than it has in the research arena, or whether innovations at the University level, such as the proposed Earth Institute, would not be more suitable to these tasks.

### **3. Reciprocal Links to Outside Community**

PoE's contribution to the facilitation of interactions with major environmental players outside the UW has thus far been through student projects, a limited amount of interaction with outside organizations, and partnership with other UW units engaged in this task. It is expanding its organization of public events in which both UW and external experts are brought together to discuss areas of societal importance. Further, PoE's engagement with major organizations and projects outside the University is starting to grow.

In the process, PoE has laid important groundwork for presenting the UW's environmental research strengths to a wider public, especially through its extensive list of faculty with environmental expertise. When the Development Office recently contacted PoE for assistance in this area, they were surprised at the richness of the data already available through the PoE website. This is an illustration of the importance of making certain aspects of PoE's work far more visible than they have been, both within the UW and externally. Until this is done, colleges and the university cannot appreciate the scope of PoE's contributions and thus may see some expectations as being unmet when in fact they have been met rather well. PoE has preferred to work quietly at the grass roots level, but it is clearly responsible for publicizing at least those aspects of its work whose impact actually depends on visibility.

Finally, PoE has delayed establishing an External Committee for a reason that would not be apparent institutionally: the early concern of the Board that a Committee from which fundraising was expected could not be appropriately representative of external environmental constituencies. After a complex series of Board discussions, discussions with the Office of Corporate and Foundation Relations, and a drastically changed university budget situation, PoE is ready to devise new guidelines for the establishment of an External Committee and through it to engage the wider community on a far broader scale than heretofore.

### III. RESEARCH AND PRODUCTIVITY

PoE has no faculty lines; so most questions in this section do not apply to it. The responses below address questions relating to teaching and to staff.

#### E. TEACHING CONTRIBUTIONS OF FUNDED FACULTY

PoE has no faculty, per se, but both of its half-time funded Co-Directors voluntarily teach classes for PoE. ZumBrunnen also is one of the seven core members of the UW IGERT urban ecology teaching team that collaboratively teach two courses each quarter throughout the year and in which PoE-funded undergraduate research students participate. The first-year urban ecology sequence's enrollment this year was: autumn – 34, winter – 14, spring – 14.

For the academic year 2001-02 the following are Palka and ZumBrunnen's teaching schedules:

Johnny Palka:

<i>Quarter</i>	<i>Course Taught</i>	<i>Course Credit</i>	<i>Credits Taught</i>	<i>Student Enrollment</i>	<i>Total Student Credit Hours</i>	<i>Pro-rated Credit Hrs</i>
<b>Spring</b>	<b>ENVIR 450B: Nature in Scripture</b>	<b>5</b>	<b>5</b>	<b>15-20</b>	<b>75-100</b>	<b>75-100</b>

Craig ZumBrunnen:

<i>Quarter</i>	<i>Course Taught</i>	<i>Course Credit</i>	<i>Credits Taught</i>	<i>Student Enrollment</i>	<i>Total Student Credit Hours</i>	<i>Pro-rated Credit Hrs</i>
<b>Spring</b>	<b>ENVIR 203B: Integrating Renewable Energy into Society</b>	<b>5</b>	<b>5/3</b>	<b>110-125</b>	<b>555-625</b>	<b>185-208</b>

#### G. FACULTY REWARDS FOR ENHANCED STUDENT LEARNING

Departments and schools are able to reward teaching excellence by merit pay increases and department teaching awards. PoE is not currently structured to influence merit pay except indirectly for faculty to whose appointment it has made a financial contribution and is therefore represented in promotion and tenure decisions. We have discussed the possibility of establishing an annual award for teaching excellence at an appropriate time in the future.

#### H. EFFECTS OF ADVANCES AND CHANGING PARADIGMS

These topics have been addressed extensively in section II. D.

## **I. STAFF**

As a unit with major service responsibilities to the University, PoE depends crucially on its small staff. Indeed, there is a sense in which PoE consists only of the two Co-Directors and four staff, all reporting to the Board and Deans. It is crucial to the success of PoE that the staff be gifted, committed, and able to work as a team. Here we present a summary of steps taken to encourage and recognize staff, and support their professional development.

### **1. ENCOURAGEMENT AND SUPPORT OF STAFF PRODUCTIVITY**

The staff have always been seen as integral to the academic program of PoE. For example, they attend and play active roles in the meetings of the Board, Certificate Program Steering Committees, and Working Groups; play a major role in the capstone process; help design faculty teaching retreats; frequently provide valuable feedback about the progress of individual courses; and are equal partners thinking about the present and future of PoE. Treating staff as valued colleagues is built into PoE's mode of operation.

In addition to performing the myriad functions necessary to the smooth operation of any academic unit, our professional staff are encouraged to design and pursue projects that creatively support the mission of PoE. The list of contributions made by staff on their own initiative is a long one including such examples as: the introduction of service learning; the intensive development of service learning and capstone sites; the establishment and leadership of the Environmental Advising Group; design of publications; Environmental Opportunities Fair; Graduate Certificate Newsletter; redesigned WebPages; development of PoE student database; concepts for seminar topics and speakers.

We have taken a variety of steps to promote team-building and a full sense of involvement with PoE's mission. These range from redesigning staff meetings, to across-staff collaboration on projects, to a SWOT (Strengths, Weaknesses, Opportunities, Threats) training process facilitated by Human Resources.

### **2. RECOGNITION AND REWARD**

In a unit as small as PoE, there is little scope for internal advancement. Partly for this reason, we have structured all of our staff positions to be Professional Staff, since this provides much greater flexibility than Classified Staff.

There have been three main mechanisms for recognition and reward of outstanding staff work:

- a) Public acknowledgement of special contributions.
- b) The maximum possible salary increases and in two cases a re-classification within grade.
- c) Recommendations for awards for outstanding service within the Office of Undergraduate Education.

Given the constraints of a small unit with a flat organization, we are always on the lookout for creative ways to recognize and reward staff. Some fall into the category of professional development. Others include encouragement to take on leadership roles in professional organizations such as APAC - both of our Academic Services Coordinators have been elected to the Board of the UW chapter.

### **3. PROFESSIONAL DEVELOPMENT**

Staff members are encouraged to take advantage of all available and relevant training opportunities. These have included the completion of a Master's degree in the School of Marine Affairs; organizational training, such as Decision-Making for Teams, Process Improvement: A Framework for Creating Excellence, Facilitative Leadership, Building Common Ground: A Team Process to Create Ground Rules and Norms; training in counseling such as Dependable Skills; and technical training in web and database skills. In addition, our staff members have attended a number of professional meetings, sometimes for their own benefit, sometimes representing PoE.

## **IV. RELATIONSHIPS WITH OTHER UNITS**

PoE is an interdisciplinary program with no faculty of its own, and its core charge is to facilitate and coordinate environmental education across the University. It is entirely dependent on productive relationships with faculty and units; indeed, apart from collecting information, it cannot do anything on its own. Therefore, the material presented in this section is core to PoE's work and not, as in the case of many disciplinary units, a relatively peripheral matter.

### **A. UNIT FACULTY ARE CENTRAL TO PoE FUNCTIONS**

Faculty members from units carry out PoE's core organizational and educational functions, as described previously in Section II.

- Co-Directors – to date three (Mike Wallace, Atmospheric Sciences; Johnny Palka, Zoology; Craig ZumBrunnen, Geography)
- Board – to date 30 different faculty members from 25 different units, plus 3 senior professional staff and 3 students (App. K-1)
- Core course teaching teams – to date 18 faculty from 16 different units (App. K-2)
- Faculty supervising capstone students – to date 37 faculty from 18 different units (App. K-3)
- Steering committee members for Graduate Certificate Programs – to date 20 faculty from 15 different units (App. P-1,3)
- Environmental Science and Engineering Group – to date 15 faculty from 15 different units (App. K-4)
- Faculty participating in PoE working groups

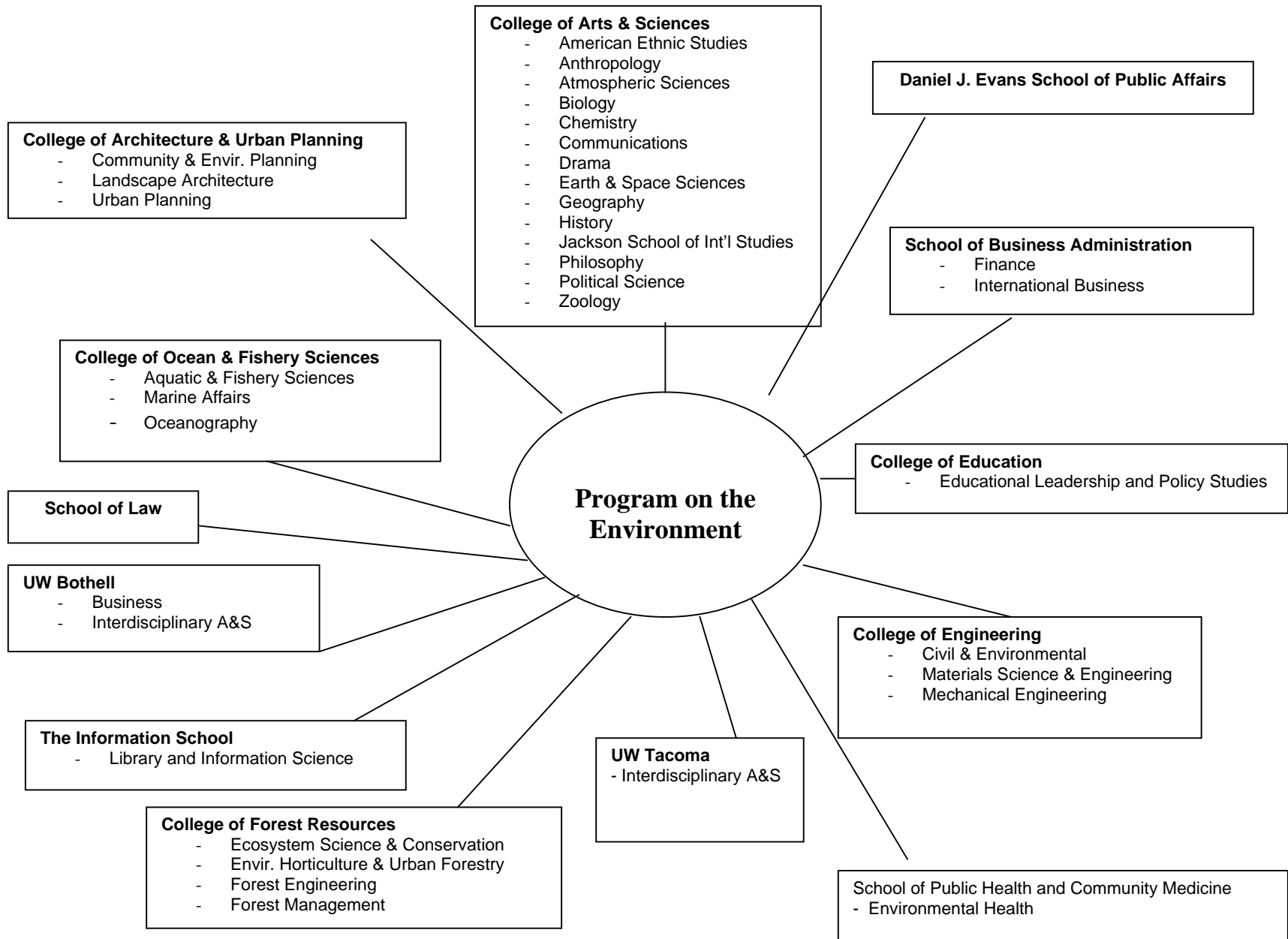
There is very little overlap among the individual faculty participating in these different PoE functions. This is the basis for the approximation that *over 100 faculty from over 35 units in at least 8 colleges and schools and all three campuses have had an active engagement with PoE during its first five years.* A pictorial view of this web of relationships is presented in Figure 2.

PoE depends on these faculty interactions. The faculty also benefit because they work collaboratively across disciplinary lines on shared goals, and these benefits can be striking. For example, Eric Smith (Anthropology) and Julia Parrish (Zoology) developed an interdisciplinary IGERT proposal linking natural and social scientific aspects of conservation biology directly on the basis of co-teaching a PoE core course for three years. The proposal was not successful, but the example nevertheless illustrates the sometimes unexpected benefits to faculty of their shared work with PoE.

### **B. UNIT GRADUATE STUDENTS PARTICIPATE IN PoE FUNCTIONS**

#### **1. TAs for Core Courses.**

Figure 2



PoE advertises for TAs to staff its core courses widely across the University and typically attracts 10-20 applicants for each available position. The teaching faculty select their own TAs on the basis of their qualifications for the topics covered by the specific course; their ability to represent the interdisciplinary approach to environmental studies; and their ability to engage students in case studies and in service learning (if offered). With the high level of competition, the faculty have generally been able to select truly outstanding TAs (App. K-5).

Given the selection criteria, PoE cannot claim be introducing these graduate students to the concept that environmental studies is an interdisciplinary field, or, in most cases, to the teaching process itself, because most of those selected already have teaching experience. Nevertheless, the TAs in PoE courses gain extremely valuable experience. They work closely with the faculty. For many this is their first experience actually participating in an interdisciplinary team, rather than merely having an intellectual commitment to interdisciplinarity. The experience is clearly rewarding, judging by the significant number of repeat applications we receive. Thus, PoE serves an important training function for units' graduate students, in addition to providing a source of funding.

## **2. Graduate Student Members of the Board and of Working Groups.**

Graduate students, as well as undergraduates, have participated as full-fledged members of the PoE Board, though we would like to increase their numbers. They have also participated very actively in all of the Working Groups that have shaped PoE, including curriculum and course design, the redesign of the Environmental Management Program, the review of the matrix and capstone portions of the curriculum and the design of the International Track. This allows important student perspectives to inform PoE's actions, and it gives the students valuable experience in the process of program building and review. The graduate students particularly are able to share this experience within their own units.

## **C. PoE PARTICIPATES IN UNIT-BASED FACULTY APPOINTMENTS**

The TFEE recommended that PoE should have no faculty lines of its own, but should be able to partner with units in facilitating the appointment of faculty who have environmental interests, particularly those who significantly extend the breadth of environmental scholarship in their unit. The funding that PoE is able to contribute for this purpose is temporary, so it is necessary to make provision for permanent funding after a few years; the details are specified in an MOU approved by the PoE Board, and signed by PoE, the unit, and the relevant deans. Part of the agreement is always the provision that the unit will contribute to PoE's teaching mission for a period of time extending beyond the funding period. This contribution may or may not be in a PoE core course, and the PoE-funded appointee need not always make it.

*This is probably PoE's most powerful tool for infusing the environmental dimension into departmental curricula and one of its most powerful mechanisms for institutional catalysis. It is also a particularly tangible and highly appreciated mode of interaction between PoE and units.*

Letters from unit chairs and directors commenting on the performance of these appointees and on their impact on their home units are provided in App. L.

During the first 5 years, PoE has participated in 11 successful hires. PoE funding was involved in 6 of these. In the other 5, PoE served as a “recruiting tool” or participated in a spousal appointment.

### **1. Appointments Involving PoE-linked Funds**

*Martha Groom and Warren Gold, ecology, appointed in Interdisciplinary Arts & Sciences, UW Bothell.* In the search for an ecologist to be added to the growing UWB faculty, two candidates had risen to the top, Martha Groom and Warren Gold. Dean Norman Rose of UWB suggested that UWB and PoE jointly approach the Provost to enable both candidates to be appointed and form the core of the biological component of Environmental Science at the new campus. The Provost approved the proposal; Gold was appointed solely at UWB, Groom received an adjunct appointment in Zoology at UW Seattle.

Both appointees have done extremely well. They have been promoted to Associate Professor with glowing recommendations from the external reviewers, and negotiations are now in progress to convert Groom’s adjunct status in Zoology to a joint appointment. (See letters from JoLynn Edwards, Acting Director, Interdisciplinary Arts & Sciences, UW Bothell, and John Wingfield, Chair, Department of Zoology.)

*Devon Peña, environmental justice, appointed jointly in Anthropology and American Ethnic Studies.* Peña was appointed at the full professor level as part of the President’s initiative on diversity in faculty hiring. PoE was strongly engaged in negotiating his joint appointment between Anthropology and American Ethnic Studies, and has contributed a third of his salary to date. Peña has been a major national figure in the area of environmental justice, serving on national committees, authoring and editing books in the area, etc. He has developed several courses for both undergraduates and graduate students, has served on the College Council in the College of Arts & Sciences, and has generally been a highly valued member of the UW faculty. PoE’s contribution to Peña’s salary will terminate at the end of the 2001-2002 academic year. (See letter from Eugene Hunn, Acting Chair, Department of Anthropology.)

*K. Sivaramakrishnan, comparative studies of land use, appointed in Anthropology.* “Shivy” has compiled a stellar record in the Department of Anthropology and has also cultivated ties with the Jackson School of International Studies, the Evans School of Public Affairs, and a number of other units including PoE. He has been recommended for promotion to Associate Professor with extraordinary praise from the outside reviewers. Bringing a strong international perspective to environmental issues, especially in the area of forest management, he has become a key player in the growing prominence of the UW in the general field of sustainable development. PoE was involved in his recruitment and paid 50% of his salary for the 1999-2001 biennium. (See letter from Eugene Hunn, Acting Chair, Department of Anthropology.)

*Julia Parrish, conservation biology, appointed jointly in Aquatic & Fishery Sciences and Zoology.* Parrish first joined the UW under the auspices of the Institute for Environmental

Studies and held several research positions. While a Research Assistant Professor in Zoology she played a major role in the design of the PoE curriculum, and co-taught the Ecology and Conservation core course (with Eric Smith from Anthropology) for three years. When it looked like she might leave the UW for a more attractive position, PoE spearheaded the development of a tenure-track position situated in Aquatic and Fisheries Sciences and in Zoology; it also agreed to contribute 1/3 of her salary until the time of promotion. Review for promotion is now in progress, once again to stellar reviews. Anticipating a successful outcome, PoE's contribution to Parrish's salary is expected to terminate at the end of the 2001-2002 academic year. (See letters from David Armstrong, Director, School of Aquatic & Fishery Sciences, and John Wingfield, Department of Zoology.)

*Michael Kucher, environmental and urban history, appointed in Interdisciplinary Arts & Sciences, UW Tacoma.* Kucher is a junior and very recent appointee, much desired by UWT to bring the perspective of history into the emerging Environmental Science program and an outstanding teacher. In addition to his teaching at UWT, Kucher is co-teaching PoE's core course in Conservation and Ecology with Jim Karr (Aquatic & Fisheries Sciences and Zoology). PoE played a significant role in the structuring of his appointment and will contribute 50% of his salary for the three-year period 2001-2004. (See letter from Bill Richardson, Director, Interdisciplinary Arts & Sciences, UW Tacoma.)

## **2. Other Appointments Made with PoE Participation**

*Linda Nash, environmental history, appointed in History.* PoE was involved in this appointment at the request of the Department of History, but not in a financial way. The Department wished to cultivate ties with PoE and specified this in the formal position announcement. The Co-Directors participated in the selection of the appointee from the Department's short list of candidates. As planned long ago, Nash has recently joined the PoE Board replacing the Chair of History, Robert Stacey. Her activities have been centered on the development of courses in Environmental History. (See letter from Robert Stacey, Chair, Department of History.)

*Sara Tjossem, history of biology, appointed in History (spousal appointment, partner appointed in Zoology).* When the Department of Zoology was trying to attract a leading ecologist, Shahid Naem, a condition of his accepting the Department's offer was a suitable position for his spouse, Sara Tjossem. Dr. Tjossem is a historian of biology who also has a Master's degree in limnology. PoE agreed to fund a part-time teaching position for Tjossem for three years (she is part of the teaching team for the core course in Population & Health, together with Charles Treser from Environmental Health and Douglas Mercer from Geography), and History provided an academic appointment as Lecturer. In Spring, 2001, Tjossem took over the coordination of PoE's capstone program. She has also been active as a research historian in the Sea Grant Program in the College of Ocean and Fishery Sciences. Naem has become a central figure in the re-development of Zoology's outstanding program in ecology following the retirement of three world-class faculty: W. T. Edmondson, Gordon Orians and Robert T. Paine. (See letter from John Wingfield, Chair, Department of Zoology.)

*Joyce Cooper, environmental design, appointed in Mechanical Engineering.* PoE played a recruiting role in this appointment, representing the breadth of environmental studies outside the College of Engineering. In her short time here, Cooper has played a major role in the enhancement of the environmental dimension in her own department and college, and has also been extremely active in PoE's Graduate Certificate Program in Environmental Management and the discussions concerning Environmental Science and Engineering. (See letter from William Wilson, Chair, Department of mechanical Engineering.)

*Peter Kahn, real and virtual nature, appointed in Psychology (spousal appointment, partner appointed in the Information School).* When the Information School sought to attract Batya Friedman to its faculty, PoE was approached for assistance in finding an appropriate position for her spouse, Peter Kahn. In part because of Kahn's notable cross-cultural studies on how children acquire a sense of nature, a position was negotiated with the Department of Psychology. Since coming here, Kahn has also developed strong ties with the Department of Computer Science because of the interest he shares with Friedman in the degree to which computer-based "nature substitutes" evoke in humans some of the same reactions that original nature does, work for which major research funding has been received. He has taught a number of innovative courses of interest to PoE. (See letter from Michael Eisenberg, Dean, Information School.)

*Aseem Prakash, political economy, appointed in Political Science.* Even as this self-study was being prepared, the Chair of Political Science approached PoE for help on very short notice in putting together an attractive package for Prakash, a prospective appointee who already had an offer from the School of Public Affairs at the University of Wisconsin. The PoE Board acted quickly and limited financial support was authorized. In the end neither this support, nor funds offered by the CIBER Program of the Business School whose Associate Director sits on the PoE Board, were required. However, the interest expressed by PoE, CIBER, and also the Evans School of Public Affairs contributed in a positive way to Prakash's quick acceptance of the offer from Political Science. It is expected that productive ties between PoE, Prakash and the Department will develop.

### **3. Academic Success**

Based on past experience, both at the UW and elsewhere, the TFEE expected that junior faculty hired with PoE participation might face difficulties in promotion and tenure because their work would not be seen as central to their unit's discipline. For this reason, PoE representation on promotion and tenure review committees was built into the collaborative hiring process. Thus far, however, all junior faculty members hired with PoE participation have been highly valued by their units. Indeed, the performance of the four individuals who were appointed as Assistant Professors and have already been reviewed for promotion and tenure (Martha Groom, Warren Gold, K. Sivaramakrishnan and Julia Parrish) has been stellar in the eyes of their units and promotion has been recommended in the strongest possible terms.

#### **4. Evaluation**

Partnering with units in making faculty appointments has been one of PoE's greatest contributions to environmental studies at the UW, for several reasons: (a) The appointees function primarily within their units, thereby introducing or strengthening the environmental perspective in those units. This applies to undergraduate education, graduate education and research in equal measure. (b) The appointees teach many courses and thereby reach many more students than PoE can reach through its own course offerings. (c) Especially given their stellar record to date, the appointees can be expected to remain prominent members of their units for many years and thus to continue contributing environmental expertise long after their PoE funding has come to a close. (d) Because PoE funding is specified to be temporary, this portion of the budget can be recycled and additional appointments can be facilitated without an increase in the funds required. Of course, the success of this process depends on the availability of permanent funds to the appointing units once PoE funding is terminated.

This has been one of the most potent mechanisms PoE has been able to use to encourage the evolution of the environmental dimension within units and to catalyze new developments, such as those described by Prof. Wilson for Mechanical Engineering.

### **D. SUPPORT FOR DEPARTMENTAL COURSES & OTHER ACTIVITIES**

In line with its mandate to encourage the development of environmental studies across the institution, PoE has provided financial support to units wishing to move in this direction.

#### **1. Targeted Enhancement of Departmental Course Offerings**

The TFEE recognized that, while non-specialized environmental courses open to undergraduates are widely available at the University, some conspicuous gaps exist. It identified Environmental Ethics as a prime example, and one of the early actions of the PoE Board was to identify others: Environmental Economics, Environmental Literature, Environmental Chemistry and Environmental Law. The relevant units were approached with the following outcomes:

*Environmental Ethics:* When PoE was established, the Department of Philosophy was already offering Environmental Ethics but on a limited basis. To strengthen this offering, PoE undertook to fund two TA quarters per year for the course, starting in 1997-98. The results of this support have been outstanding. David Shapiro, a TA funded by PoE, won the distinguished Teaching Award shortly after PoE support started. Enrollment in the course has grown steadily over the years. Further, the whole area became an important building block in the successful UIF proposal developed by the Department for a multi-unit program on Values in Society in which PoE is a partner.

*Environmental Economics:* Environmental and Resource Economics are traditional areas of strength in the Department of Economics, but the available courses were quite advanced and therefore laden with prerequisites. This made them inaccessible to most undergraduates other than Economics majors. In 2000-2001 the Department approached PoE with the offer that if PoE

paid for the development of a 200-level Environmental Economics course for non-majors and for its teaching during the first year, the Department would maintain the course thereafter. This arrangement was consummated and the first iteration of the course was offered in Autumn Quarter, 2001. It filled to capacity and was well reviewed. Regrettably, the Economics Department's potential budget cuts may impact its commitment to continuation of the course on the level of frequency that student demand would warrant; however, negotiations on this central point are in progress at the present time.

*Environmental Literature:* PoE supported a special topics course on Ecological Theater (DRAMA 499/ENVIR 450), given by Drama graduate student Theresa May in 1999-2000, which received glowing reviews from both students and faculty. Environmental Literature was introduced and funded as a PoE course (ENVIR 450) in Winter Quarter, 2001. Taught by David Morris of UW Tacoma, it will be given again in Spring Quarter, 2002. In the meantime, Gary Handwerk, Chair of Comparative Literature, approached PoE to discuss his own development of a course in Environmental Literature linked to a parallel course offered in several area high schools. PoE hopes that this very creative program will continue and will become the focus of Environmental Literature on the Seattle campus.

*Environmental Chemistry:* This field is highly developed in the School of Oceanography but has had a complex history in the Department of Chemistry. In 1997-98 PoE funded an RA to help revamp CHEM 115, Chemistry for Life, to include a strong environmental emphasis. This course for non-majors is still offered, but only on an irregular basis.

*Environmental Law:* The situation in the School of Law is much like that in the Department of Economics. Several extremely distinguished faculty members specialize in Environmental Law, and indeed have taught in PoE courses and/or served on the PoE Board, but courses for undergraduates are not readily available. Marc Hershman, Director of the School of Marine Affairs, a PoE Board member, and a lawyer by training has undertaken discussions about this situation. It is unlikely to be resolved in the near future, so Prof. Hershman is redesigning a course he has taught to graduate students at SMA for many years to serve a wider clientele. This is a continuing discussion.

## **2. Support for Courses Requested by Units**

Like the courses specifically targeted by the TFEE and the Board, the following have been deemed to be sufficiently valuable additions to the University's overall environmental offerings to merit TA support by PoE.

*Forest Resources:* PoE has provided TA support to several courses in the College of Forest Resources, including Management of Threatened and Endangered Species (ESC 458) in 1998-99; Introduction to Environmental Science (ESC 110) in 2000-2001 and 2001-2002; and Institutionalizing Sustainable Ecological Practices (ESC 460) in 2001-2002.

*Mechanical Engineering:* PoE has shared TA support with several other units for Energy and the Environment I and II (ME 340 and ME 341), joint-listed with Physics, Chemical Engineering and PoE, for several years. These courses, which draw students from a wide array of

programs, have grown substantially in popularity. They form the basis for the preliminary design of an Energy minor in the College of Engineering.

*Civil & Environmental Engineering:* A proposal has recently been made to PoE for a new course in Environmental Engineering. Many details remain to be worked out, but the basic design, revolving around real-world problems treated quantitatively but only at the level of algebra, is very attractive. The teaching time would be donated by CEE; TA funds would be provided by PoE or shared with CEE.

### **3. Support for Lecture Series and Similar Events**

On quite a number of occasions PoE has provided partial or full support to lectures and lectures series whose primary origin was in units but whose content was of interest to PoE. This form of support to unit efforts is summarized in PoE's Annual Reports (the Report for 2001 is included as App. Q) and is not reported in detail here.

The general effect of this form of support to units has been to raise the visibility and academic representation of environmental studies in units, and particularly to emphasize its interdisciplinary nature.

### **4. Environmental Science**

The present degree offered by PoE is the interdisciplinary liberal arts B.A. in Environmental Studies described in Section VI below. It complements the many disciplinary degrees offered by units engaged in studies related to the environment, collectively described in the EAG brochure (App. I-1).

For over a year PoE has held discussions about how a coherent interdisciplinary program in Environmental Science, with defined links to work at the Master's level, might be organized. The vehicle for these discussions is now the Environmental Science and Engineering Group in which 15 units, including the two policy schools, are participating (App. K-4). This effort is an exploration of intellectually desirable and cost-effective alternatives, and not presently an exercise in degree design. The discussions are at a very early stage, but already possible curricular linkages, institutional degree design limitations, and desired modifications in departmental core courses are being identified. It will undoubtedly take some time before concrete proposals emerge, but there is clearly merit in holding such discussions on an institutional scale rather than just in the individual units in which they are occurring now. The approach taken by this group is modeled after that of the Environmental Advising Group, in which exchange of information and cultivation of trust and respect precede any collective action.

## **E. ENGAGEMENT IN COLLABORATIVE FUNDING INITIATIVES**

PoE has partnered with other units in several successful proposals for major grants providing funding in the range of hundreds of thousands to millions of dollars.

*Undergraduate Research Apprenticeships at Friday Harbor:* This program brings teams of undergraduates to the Friday Harbor Laboratories to work on full immersion research projects for a quarter with teams of UW faculty. It provides a research experience rarely matched elsewhere at this institution. PoE participated in the development of the proposal for this program, initially submitted to the UIF but actually funded through Tools for Transformation. The program has attracted significant funding from other sources.

*Restoration Ecology Network (REN):* As in the previous case, PoE participated in developing the proposal for this program, ultimately funded by Tools for Transformation. Students from all three campuses take a series of courses in restoration ecology taught by faculty from all three campuses. The program culminates in an intensive restoration project for a client, selected on the basis of a request for proposals. TtT funds will be coming to close in about 6 months and a request has been made to house the program in PoE. The Board will be taking up this request later in Spring Quarter. A report on REN is provided in App. VIII.

*Cooperative Ecosystems Study Unit (CESU):* The new Pacific Northwest CESU, coordinated by the College of Forest Resources, is one of 10 multi-million dollar, multi-institutional programs that bring together Federal agencies, universities and colleges in partnerships for research, technical assistance and education to enhance understanding and management of natural and cultural resources. Five agencies and some 16 educational institutions are involved in this new program. The CESU will provide students the opportunity to participate in major research projects and to experience first-hand the complexities of working in situations in which environmental decisions with large impacts are being made.

*IGERT Program in Urban Ecology:* The Interdisciplinary Graduate Education and Research Training Program (IGERT) is the NSF's flagship program for promoting the interdisciplinary training of scientists and other scholars. With the award of the IGERT in Urban Ecology, the UW became one of the first universities in the country to house three of these highly prestigious and competitive awards (the other two awards are in Astrobiology and in Nanotechnology). This is primarily a graduate program, but a number of research positions for undergraduates are also being provided; PoE offered to fund three of these per year to strengthen the proposal. PoE Co-Director Craig ZumBrunnen is a Co-PI on this award.

*UIF Program on Values in Society:* The TFEE Report identified Environmental Ethics as an area in which greater strength should be developed, particularly at the level of courses available to undergraduates. As pointed out above, among PoE's first actions, even before the establishment of its own major, was to work with the Department of Philosophy and provide TA support so that the existing course in Environmental Ethics could be taught more frequently and regularly. It is particularly gratifying, therefore, that a proposal for a major enhancement of faculty strength in applied ethics, including Environmental Ethics, should have been selected for one of the five UIF awards in 2000-2001. Unfortunately, implementation of this award is currently on hold due to the University's budgetary crisis.

*Business Courses for Non-Business Majors:* PoE participated in the development of this concept, believing that an understanding of the business perspective on environmental issues is very important in environmental studies (for this reason business is a major component in the

design of the Graduate Certificate in Environmental Management). Originally submitted as a UIF proposal together with the Schools of Pharmacy and Nursing, the Business School has actually been supporting this program and external sources are expected to fund this program entirely in the near future.

In addition to these very large awards, PoE is also a participant in a smaller, three-year grant from the Hewlett Foundation called Global Classrooms, coordinated by Kim Johnson-Bogart, Assistant Dean of Undergraduate Education. This program supports faculty/student teams working with partner institutions in Eritrea, South Africa, Argentina, China, and Japan, and provides excellent opportunities for undergraduate students with environmental interests such as the PoE/PoA collaboration described below (Sect.VI.).

PoE cannot claim a major role in the preparation of any of these proposals. Rather, its role has been a supportive one though often in the early, formative stages of proposal preparation when PoE's emphasis on interdisciplinarity has been influential. It is important to note that the lead authors have repeatedly invited PoE's participation. *We take this as a strong indication that collaboration with PoE is seen as representing significant value added by numerous, diverse, enterprising and distinguished faculty and units working in environmental studies broadly defined.*

## **F. FACILITATION OF INTER-UNIT ACTIVITIES**

The major initiatives in this area have been described in Section II:

- The Environmental Advising Group
- The Environmental Science and Engineering Group
- Support for interdisciplinary environmental graduate student groups

PoE's support of Graduate Certificate Programs can also be seen in this light. New initiatives are in preparation; for example one on sustainability in the UW curriculum has already been brought forward for preliminary discussion by the Board.

## **G. CURRICULUM DEVELOPMENT IN UNITS**

PoE has been invited to participate the development of unit curricula several times, most especially by the College of Forest Resources.

### **1. Sustainable Resource Science (SRS)**

This major within CFR was developed primarily by Chuck Henry, a member of the research faculty, and discussed several times by the PoE Board. Its overall design was modeled closely after that of the Environmental Studies B.A., utilized the PoE core courses, and administered its capstone component in part through PoE. Over time it has become more independent of PoE and more firmly embedded in CFR.

## **2. Curriculum Redesign in CFR**

CFR is now in the process of a thoroughgoing re-design of its entire curriculum, including SRS, with a greatly increased emphasis on environmental science and ecosystem management relative to the more traditional areas of timber management and harvest. PoE has been invited to participate in some of CFR's discussions, and PoE core courses may form part of the requirements of the new major. Reciprocally, CFR has been one of the most active participants in the discussions on Environmental Science and Engineering spearheaded by PoE. PoE has had a particularly close working relationship with CFR stretching back several years, and we hope to continue this relationship in the most constructive ways possible.

## **V. DIVERSITY**

### **A. UNDERREPRESENTED GROUPS – STUDENTS, FACULTY, STAFF**

#### **1. Students**

The diversity among PoE majors is substantial; nearly half of our students belong to underrepresented groups. According to University statistics, for officially registered majors the figures for Autumn Quarter, 2001, were: Caucasian - 55%, African-American – 15%, Asian – 4%, American Indian – 4%, foreign – 4%, and other - 18%. Approximately 60% were women.

#### **2. Faculty**

PoE has no faculty of its own. However, it participated actively in the President’s Diversity Initiative for Social Science Faculty by playing a major role in the recruitment of Devon Peña to the Departments of Anthropology and American Ethnic Studies and contributing 25% of his salary for three years. Prof. Peña’s academic focus is on environmental justice, particularly though not exclusively within the United States.

In addition, PoE help recruit K. Sivaramakrishnan to the Anthropology contributed 50% of his salary for two years. Indian nationals are not usually considered an underrepresented minority. However, it is important to recognize that Prof. Sivaramakrishnan brings a significant element of diversity and a culturally comparative perspective both to his department and to PoE, reflected in both his research and his teaching.

From the point of view of gender:

- 5 of the 11 faculty whom PoE has helped to appoint have been women
- 3 of the 18 faculty who have taught PoE core courses have been women
- 8 of the 33 faculty and professional staff who have served on the Board have been women

#### **3. Staff**

There are no underrepresented minorities among our small staff of four. Three of the four are women.

### **B. TEACHING LOADS AND OTHE DUTIES**

Not applicable.

### **C. OUTREACH AND RECRUITMENT**

## **1. Action Steps**

PoE student recruitment thus far has not specifically emphasized underrepresented groups. Nevertheless, as shown in (A) above our population of majors is very diverse.

Newly initiated efforts to increase diversity still further include:

- the participation of the Graduate Program Coordinator in the National Conference of the Association for Minorities in Agriculture, Natural Resources, and Related Sciences (MANRRS) in Portland in April, 2002.
- the participation of the Academic Services Coordinator in the 12<sup>th</sup> Annual Student of Color Career Fair in Olympia in August 2002.

Our long-term strategy includes engagement with a number of UW programs who are already active in minority recruitment, including the Office of Minority Affairs, the Bridges 4 Program, the Minority Science and Engineering Program, American Indians in Science and Engineering, the Multicultural Alumni Partnership, UWSTEM (Science, Technology, Engineering and Mathematics) Outreach Program, UW Educational Outreach, and multicultural student clubs and organizations.

## **2. Positive and Negative Factors**

Environmental Studies is widely regarded as a field that attracts predominantly white, middle class students and professionals. We can only speculate as to why the situation is so different in PoE. We offer as a possible explanation the unusually welcoming atmosphere provided by our advising staff who have all been personally committed to diversity, enhanced by the relatively small size of the program that allows a great deal of personal interaction between students and advisers. The emphasis on case studies and experiential learning, and the declared focus on Ethics, Values & Culture as one of the four required domains of inquiry, may also favor the understanding that PoE is committed to an inclusive curriculum and the recognition of multiple perspectives on serious problems.

We are not aware of any special problems regarding retention of members of underrepresented groups. The existence of a large number of University-based programs dedicated to the recruitment and retention of minority students will allow us to do an even better job in the future.

## **D. CHANGES IN THE PROGRAM STEMMING FROM INCREASED DIVERSITY**

With a history of only 3 1/2 years of having students in our program, it is premature to try to identify changes attributable to increasing diversity. The faculty, however, value diversity and a multicultural approach and always include it in their teaching. As pointed out above, a multicultural approach was designed into the PoE curriculum from the beginning.

## VI. DEGREE PROGRAMS

### A. THE UNDERGRADUATE DEGREE

#### 1. OBJECTIVES OF THE DEGREE

##### a. General Learning Objectives and Skills for Lifelong Learning

As repeatedly emphasized in this Self-Study, both the TFEE and PoE itself have conceived of Environmental Studies as the broad and thoroughly interdisciplinary approach to environmental problems. This implies the following learning objectives:

- Becoming steeped in an *integrated* approach to environmental issues; taking courses in multiple disciplines is not enough.
- Recognizing that dealing with the scientific aspect of environmental issues requires grappling with the cumulative nature of scientific disciplines; taking a survey course in one of the sciences relevant to the environment is helpful, but it does not take the place of majoring or at least minoring in that field.
- Learning to appreciate that when there are multiple viewpoints on a single issue, it is generally true that each of them has some merit, even the ones with which one initially disagrees.
- Appreciating that some of the most profound differences in perspective are related to cultural and economic setting.
- Understanding the difference between stating a viewpoint and marshalling evidence to make a compelling argument.
- Being able to find relevant data and evaluate its quality.
- Being able to distinguish between data and interpretation and being able to handle data in a quantitatively appropriate way.
- Being able to present one's viewpoint and/or findings both in writing and orally in a public setting.

##### b. Professional Skills

- All of the skills listed above are repeatedly asked for by employers and graduate programs.
- Direct, on the ground experience with environmental problems is invaluable.
- To some extent, training at the B.A. level can be shaped to prepare students for particular careers, for example in education, policy, community work or the international arena; each of these requires the cultivation of a different set of professional skills. Because the degree culminates with a Senior Capstone Experience that requires 210 hours of fieldwork or independent research, all PoE undergraduates develop professional skills specific to their Capstone project, and many prepare for the experience by taking suites of courses to develop specific areas of expertise.

### **c. Benefits for Program, University and Region**

- PoE's first designated priority was to develop a strong and interdisciplinary undergraduate degree program that complements, rather than competes with, established environment-related disciplinary programs.
- The program is the only one actually called "environmental" and thus helps call attention to the University's environmental strengths for students in high schools and community colleges who are seeking environmental programs. Many incoming students initially attracted to the concept of "environmental studies" actually discover other environment-related degree programs via PoE's undergraduate advisers who regularly advise premajors of the full array of undergraduate environmental programs.
- PoE was asked to forge links among the many units at the University whose own disciplines and curricula bear on environmental issues; the degree program contributes to this task in multiple ways, first and foremost by drawing faculty from diverse disciplines into interdisciplinary teaching teams.
- The program produces graduates whose breadth of training is valued by their employers and by the graduate programs which they attend; this is especially true of students who pursue double majors or double degrees.
- Numerous career options are described below.

## **2. STANDARDS FOR MEASURING SUCCESS**

The most basic means of achieving the learning objectives, both general and professional, is by designing a curriculum that addresses those objectives directly. The following highlights demonstrate how this is done in the Environmental Studies B.A. The full formal description of the undergraduate degree is presented in App. C.

### **a. Degree design**

(a) Four *domains of inquiry* are recognized: Natural Sciences; Social Sciences; Law, Policy and Management; and Ethics, Values and Culture.

(b) Three defined *tracks* within the degree are recognized: Ecology and Conservation; Population and Health; and "Resources," a term for the physical end of the spectrum of fields including climate, energy, etc. In addition, there is provision for an individually designed track, and an International Track is in the final stages of design.

(c) A core course constitutes the foundation for each of the three tracks, and all majors take all three core courses. Each course is designed to model the interdisciplinary view of environmental issues that is so basic to PoE through two principal mechanisms: (i) It is team taught, the team consisting of one natural scientist and at least one other instructor representing the other domains of inquiry. (ii) It deals extensively with at least one case study which is also a vehicle for active student participation (an example is mock Kyoto Protocol negotiations).

(d) The four domains of inquiry and three tracks constitute a matrix for identifying courses throughout the university that students take to deepen their disciplinary knowledge in an organized way.

(e) The degree program is completed by a capstone experience in three parts: a pre-capstone seminar devoted to defining the project each student will work on and identifying an appropriate faculty adviser (1 credit); the project itself and an analytical paper resulting from it (7 credits); and a post-capstone seminar devoted to reflecting upon the project, making a public presentation, and defining career goals (2 credits).

This design speaks directly to the objectives stated above as follows:

*Integration among disciplines* is demonstrated and modeled by true team teaching in the core courses, in which all members of the teaching team plan the course together and are present at all class sessions.

*Further training in diverse disciplines* is provided by unit-based courses that fulfill the matrix requirements.

*The cumulative nature of scientific training* is emphasized to students through good advising. Students' recognition of this is shown by the high fraction of PoE majors who take parallel degrees in other fields, mainly in the sciences.

*True respect for multiple viewpoints* is engendered by a variety of active learning processes in the core courses, in which students are required to take and argue stakeholder positions. It is often also a major lesson in service learning and capstone projects.

*Diverse cultural and economic perspectives* are embedded in use of case studies and further emphasized through the rapidly expanding international aspect of the curriculum.

*Finding, evaluating and interpreting data* are exercised in a variety of ways, starting with the case study components of the core courses and culminating in the capstone projects.

*Written and oral presentation skills* are introduced in the core courses and honed in the capstones.

## **b. Core Courses**

Core courses of high quality are the foundation of the Environmental Studies B.A. They are also starting to be used by other programs to satisfy their own core requirements (see Sect. c below).

*Course Design and Logistics.* The combination of multiple viewpoints, multiple instructors and the expectation of active, public participation is very challenging for students. For this reason, the enrollment has been capped at 100. The limit will probably be raised to 125 next year both to accommodate growth and in order to create an Honors section taught by the faculty (see below). In response to increasing student demand, the number of courses has been progressively increased from 3 per year to 5. Interested faculty even before any request from PoE proposed the additional courses; one of them has a major laboratory component. The course

instructors have come from a wide range of units, and most have been senior faculty. A description of current core courses is included in recent course flyers (App. M-1).

In view of the high expectations presented by these courses, they have been numbered at the 200-level. This has proven to be a useful approach: of the approximately 250 students enrolled in core courses during Autumn and Winter Quarters of the present academic year, only about 20% have been freshmen despite the unusually high enrollment pressures university-wide. As expected, students in the core courses represent a wide variety of majors in addition to Environmental Studies.

*Service Learning and Internships.* Because of the belief that it is important to see environmental problems in a societal context, a service learning option is currently offered in about half of the core courses. Approximately a third of the students take advantage of it. In partnership with the Carlson Leadership and Public Service Center, over 50 service learning sites have been developed (App. M-2) and mechanisms have been put on place for monitoring the quality of the students' experience (App. M-3). It is this support that makes it possible for faculty to offer service learning. A course, Environmental Studies 350: Independent Fieldwork (ENVIR 350) has also been allocated to internships and to organized courses offered by non-UW organizations; credit is dependent on supervision by a UW faculty member.

The growing interest of students in participating in experiential education opportunities offered by PoE is evidenced in the rapidly increasing number of hours that students devote to community based projects through service learning within PoE courses, Environmental Studies 350, and the Capstone Experience. For the 1998-1999 academic year, PoE students invested approximately 250 hours in community based service work. In the very next year this number jumped to 3,460 hours.

*Like the overall design of the B.A. curriculum, the design of the core courses is based on the learning objectives described above. Congruence between learning objectives and curriculum design is the first step towards achieving the desired learning outcomes.*

The steady growth in enrollments in these courses is also a good sign of quality, but we see the partnerships described in the next section as a stronger indicator.

### **c. Core course partnerships**

The moderate size and high challenge of the core courses are the bases for programmatic interactions with three other units, the Honors Program, the International Studies Program in the Jackson School of International Studies (JSIS), and the College of Forest Resources.

*Honors* students complete their requirements in departments, but they start their program by taking a series of core courses offered directly through the Honors program. The heart of their success is small size (limited to 40), the high concentration of exceptionally capable and motivated students, and the interest of faculty. Honors has been asked to double the size of its program, but doing so with no modification would mean doubling the number of courses and faculty, a proposition that is not only costly but also difficult to accomplish because departments

are increasingly reluctant to lend their faculty to interdisciplinary programs. Therefore, partnership arrangements are advantageous to Honors, and PoE is a natural partner.

PoE core courses are modest in size even though large compared with the Honors model, and they are attractive because of their intellectual breadth, team-teaching and case study approach, and expectation of active student participation. In an effort to approximate the benefits of a high density of outstanding students and high teacher-student ratio, special Honors sections of PoE courses are being created that will be taught by faculty rather than TAs. At full enrollment, then, the courses will have 5 sections of 25 students each, 4 taught by TAs and one by faculty, raising the total enrollment to 125. This arrangement meets the needs of the Honors Program at no additional total cost. The first such courses are being offered in Spring, 2002. It is anticipated that there will be an ongoing dialogue between PoE and Honors to monitor the success of this arrangement and make any adjustments that seem appropriate. In addition, there has been a growing number of students requests for an Honors track within PoE. This possibility will be explored soon.

*The International Studies Program*, the largest major in the Jackson School and also a program that draws outstanding students, recently introduced an Environmental Track in response to high student interest. This track includes a choice of two of PoE's core courses among its requirements. Among other things, these courses serve the important function of introducing science into the International Studies curriculum. The first few International Studies majors are currently enrolled in PoE courses; we anticipate reviewing the success of this arrangement at a later time.

*The College of Forest Resources* has started to consider specifying certain PoE core courses as one way of meeting part of their own core course requirements. While this plan is still in relatively early stages of development, it is attractive to both units. For PoE it represents another pool of students for whom the interdisciplinary approach to environmental issues is highly appropriate. For CFR it represents both an economical way of meeting part of their curricular requirements and a way of integrating their students with the wider campus environmental studies community. There is some possibility that CFR may contribute to the teaching of PoE courses.

*We believe that these multiple partnerships relating to the core courses, sought out by the partner units rather than by PoE itself, speak to the perceived quality of these courses and to the value seen by others in their boldly interdisciplinary design.*

#### **d. International Programs**

*International Track.* From the start, the PoE curriculum has included a global dimension, and international issues have always held a prominent place. More recently a Working Group drawing approximately 20 faculty, staff and students from around the university recommended that PoE add an International Track to the existing tracks in the Environmental Studies B.A., and that a key component of this track be a substantive experience in a foreign country. A detailed proposal is nearing completion with the collaboration of the Office of International Programs and Exchanges.

*Study Abroad Program in Auroville.* As an initial step towards internationalizing its curriculum, in 2000-2001 PoE helped to support a study program in Auroville, an international experiment in developing a rural community based on modern principles of sustainability and ecological restoration but embedded in the ancient culture and traditions of South India. This program, led by Karen Litfin (Political Science), had both a course component and a service-learning component (App.N-1). A modified version is taking place in 2001-2002 led by Chuck Henry (Forest Resources) and Sergio Palleroni (Architecture), again with financial support from PoE. The enrollment in this study program is necessarily restricted, about 20 in the first year and 40 in the second. The demand among students, however, is high; each year 2-3 times as many students have applied as could be accommodated.

The PoE Board has approved in principle a proposal that PoE support this program on a regular basis in collaboration with Political Science and with Comparative History of Ideas (CHID). *The program is now financially self-sustaining, so support will be primarily in the form of academic engagement, not ongoing financial contributions.*

*Bi-National Program with Canadian Studies.* PoE worked with the Canadian Studies Program of the Jackson School to present a new course, "Puget Sound/Georgia Basin: Protecting and Managing an International Ecosystem," in Autumn Quarter, 2001. The University of British Columbia offered a parallel course, and students from the two institutions worked collaboratively. The associated public lecture series included representatives from the EPA, Environment Canada, business and native communities - groups that have produced the recent Joint Statement of Cooperation on the Georgia Basin and Puget Sound Ecosystem; this series was supported by a grant from the Weyerhaeuser Corporation. A full report is provided in App. N-2.

This major effort was a tangible manifestation of the agreement-in-principle signed by the Presidents of the UW and UBC in June 2000, for a joint Canadian-American Studies Program. *All parties considered this project a stunning success and plans for its continuation are being developed.*

*Bi-National Program with PoA.* Planning is currently under way for a year-long collaborative effort involving PoE, the Program on Africa (PoA), and, in a more peripheral way, the Community and Environmental Planning Program (CEP), for a year-long series of courses related to the UN-sponsored Earth Summit on Sustainable Development that will take place in Johannesburg in September, 2002. In partnership with the University of Port Elizabeth in South Africa, electronically mediated shared courses will be offered in Autumn and Winter Quarters and a "Parallel Summit" will be staged in Spring. The Honors Program as one of its core course options will also offer this sequence. This program will be supported by a Hewlett Foundation grant for electronically-mediated international collaborations awarded to the Office of Undergraduate Education in which both PoE and PoA are partners. Technical support will come through the Office of Educational Partnerships.

The UW is making a concerted effort to identify and coordinate the large but dispersed number of international efforts that exist at the institution, a situation not unlike that of environmental

programs. There is a significant area of overlap between environmental and international programs that constitutes a fertile ground for the kind of coalition building that PoE is showing itself to be good at. We expect this to be a major PoE activity in the coming years. *In terms of measuring success, these programs contribute highly desired cross-cultural, international and practical experiences to the PoE curriculum. Their impact on students, participants and supporters is demonstrated by the reports on the Auroville and Canadian bi-national programs included in App. N-1, 2.*

#### **e. Specific methods of measuring success**

*Student reports.* PoE's degree program is very young, having admitted its first students only about 3 1/2 years ago. Thus, statistical evidence is still scant. For that reason we focus on personal evaluations from selected students, five of which are presented in App. O-1.

These particular students, all still in the program, have the following profiles:

- Linda Lyshall is majoring exclusively in Environmental Studies and expects to enter a graduate program in policy studies; she has participated in the Research Apprenticeship Program at Friday Harbor, which PoE helped to design.
- Katherine Robinson is likewise a PoE major. She has done both service learning and her capstone at the EPA.
- Josh Reese is majoring in Environmental Studies with minors in Geography and in Society and Justice. He has done extensive work with the EPA.
- Krissy Paynter is taking two degrees, the B.A. in Environmental Studies and the B.S. in Biology Track II (Ecology, Evolution & Conservation Biology). She has done field research at the University of Minnesota's Cedar Creek Natural History Area and is this year's recipient of the Sterling S. Munro Fellowship in Public Service.
- Madhu Narayanan is also taking two degrees, the B.A. in Environmental Studies and the B.S. in Atmospheric Sciences. He spent a year studying in Egypt and is the current undergraduate representative on the PoE Board.

We have obviously selected good students. In evaluating the quality of a young and small program, however, we believe that *the experiences of good students are appropriate indicators of what the program actually offers. If it meets the expectations and supports the aspirations of the students who most want to learn, the basic design of the program must be a good one.*

*Capstone evaluations.* The capstone is the culmination of the B.A. degree, so the reports we collect from the faculty advisers, field site supervisors and students themselves reveal a great deal about the quality of the program in general, as well as the specific capstone experience. Improvements in the capstone process have been made on the basis of these evaluations. Sample learning contracts and evaluation forms are provided in App. O-2.

We are particularly pleased when unsolicited praise of student capstone performance comes our way. Here is one example, from Prof. Marc Hershman, Director of the School of Marine Affairs, PoE Board member, and a capstone faculty supervisor:

“You may recall that I mentioned that I am supervising Mike Hong’s capstone. He works for Heart of America, a watchdog group keeping an eye on the Hanford Nuclear Reservation and their waste disposal practices. I commented that I thought HoA was not doing a very good job preparing and guiding Mike in his work. They put him in front of a huge box of documents recovered through FOIA requests, and said “read and find anomalies in the process.” It did not appear that they gave Mike any good background about the process the reservation uses to receive and process radioactive wastes.

Since then I have met with Mike twice and my viewpoint about his experience has changed. Although he was thrown into the work with little preparation, the results are excellent. He carefully reviewed and documented the materials, and from this exercise was able to learn the process, identify mistakes and irregularities, and generalize these anomalies into a report for HoA. More than that, at an important meeting last week he presented his findings about irregularities to a group of officials from Hanford and the regulatory agencies. He got their attention very quickly, and based on Mike’s report, they are looking into the issues he identified. HoA is very pleased with Mike’s work.

From a learning standpoint, I think Mike has gained a great deal from this. He now understands this one environmental issue from multiple perspectives – classification and documentation of radioactive wastes, administrative process in shipping, receiving, and accounting for waste disposition, long-term management and monitoring of the waste stream, the technology of waste storage, and the politics of operator-regulator-watchdog interactions. Further, he gained confidence through learning that order can be made from chaos by persistence and looking for patterns. If this is what we want from the capstone experience, then we can declare victory!”

*Review by Working Groups.* Despite the young age of the program, the matrix and capstone portions of it have already been carefully reviewed by Working Groups including members who have no special affiliation with PoE. Their recommendations are being implemented, or will be soon. The core courses will be similarly reviewed as soon as time allows.

*Honors accorded to students.* During these first 3 1/2 years, two PoE students have been awarded Sterling S. Munro Fellowships for Public Service by the UW; two have been the University’s nominees for the Morris K. Udall Fellowship, which provides funding to outstanding sophomores and juniors who study the environment and related fields; and one is currently a finalist in the competition for a Truman Fellowship.

*Growth of the program.* Growth is an equivocal measure of success because it is influenced by so many factors besides the quality of the program. Nonetheless, a reasonable rate of growth must be expected of a new program. In the case of the Environmental Studies B.A., growth has been significantly slower than the TFEE expected, but closely in line with what was projected when the formal degree proposal was submitted to the HEC Board (App. C-1). At

present the number of active majors (both those who have met all admission requirements and have therefore formally declared the major, and those who are proceeding as permitted by our requirements but have not yet made a formal declaration) is 80-85. The number who complete the degree requirements including the capstone has risen to about 25 per year, though some of these stay on to complete other degree requirements. The “headcount” projected for the third year of the new degree was 100 majors, which was also expected to be the steady state, so the program is within 20% of the target. The number of minors was also expected to reach 100; it is currently substantially less than that, 15-20.

#### **f. Interpretation**

We consider the Environmental Studies B.A. to be a strong degree program on all qualitative criteria: student reports, faculty reports, student academic recognitions, use of core courses by distinguished other units, interest of faculty in teaching in the program, and so forth.

#### **g. Recruitment**

*Recruitment.* The one aspect of the program we are not satisfied with its relatively slow growth, even though the number of majors is in line with the projections made to the HEC Board. We have set doubling the size of the program in the next two years as a target, and believe that this is realistic for the following reasons: (a) Judging by feedback from community college and high school advisers, the recruiting materials developed by PoE undergraduate advisers in conjunction with the Environmental Advising Group are very effective, even though they are so recent (summer 2001) that their impact on enrollments cannot yet be assessed. (b) A systematic recruitment strategy was put into place during academic year 2000-2001 and will be continued this year despite the loss of one full-time undergraduate adviser who has only recently been replaced. The strategy includes many ongoing efforts starting with regular contact with advisers at the five top community college feeder schools. All of these activities involve coordination with the Environmental Advising Group to avoid duplication of effort and to share resources. (c) Additional effective strategies are being developed, including the on-line chat room described in Sect. II.A.5, and well targeted e-mail announcements that have led to a recent 10-fold increase in the number of students attending environmental information sessions. (c) The growing reputation of the program. The surge in the number of inquiries by Honors students about an Honors option within PoE is a good example. (d) The steady growth in enrollments in the core courses. We know from student comments that the core courses often bring students into the major.

*PoE is committed to a shared approach to recruiting with all environmental majors. We see this as a strength, not an impediment. Not only is it in alignment with PoE’s overall mission, but also many of the most promising recruitment tools have come from a pooling of ideas among the EAG advisers.*

*Impacts of growth.* The capstone is a key feature of the B.A., and the hoped-for marked increase in the number of students doing capstone projects will strain our current process. Looking forward to that situation, we have begun to forge capstone partnerships with programs such as Landscape Architecture, the School of Marine Affairs, Geography, and the Restoration

Ecology Network all of which have capstone programs well suited to PoE majors. It should be possible to accommodate a doubling in the number of majors with no increase in the total cost of the program.

A bigger financial obstacle will be staffing of core courses if they continue to grow at the present rate. The cap on enrollment is being raised from 100 to 125, but beyond this the courses would suffer significantly and we will make every effort to increase the number of courses rather than the number of students per course. One way of moderating the costs will be to aim for new faculty teams of two rather than the three that is now the norm. We will also seek further creative arrangements for minimizing the costs of the core courses.

### **3. UNDERGRADUATE INVOLVEMENT IN RESEARCH**

#### **a. Research projects**

Service learning, internships and the mandatory capstone are all research-like experiences that are integral to the entire B.A. curriculum. About 25% of the capstones are relatively conventional faculty-guided research; the other 75% take place off campus. A full list of capstone projects completed or in progress is provided in App. O-3). Some of them are more service than research oriented, but most (such the example quoted on p. 49) have components of both research and service. From the student point of view, all types are seen as equally valuable.

Active involvement with the wider community is part of PoE's mission and a clear grasp of the societal setting of environmental issues is one of our principal learning objectives. We therefore construe research in a relatively broad way, and ask the faculty advisers to focus on helping students link the experiential component of their capstone to the conceptual frameworks they have acquired through their course work.

#### **b. Other teaching innovations**

*Core course design.* The entire design of the core courses, based on team-teaching, case studies, active student participation, and optional service learning can be seen as an innovation. It is a far cry from the typical disciplinary introductory course with an overwhelming emphasis on "coverage," and more similar to the recently introduced introductory courses in engineering that revolve around design.

*Internationalization.* The deliberate internationalization of the curriculum is an innovation, especially once the International Track with its required foreign experience is in place. It represents a creative blending of three of the University's faculty strengths: in environmental studies, in international studies, and in international research programs situated in diverse disciplines.

*Focusing the major.* The Capstone Working Group recommended as a specific improvement in the overall program the introduction of a 300-level seminar course that would help students focus their matrix course work, particularly in preparation for the capstone. The capstone programs in Geography, the School of Marine Affairs and the Restoration Ecology

Network with whom we are discussing capstone partnerships, require such focus, but it is desirable for all students. This idea has been borrowed from the Geography Department but will be new to PoE. It is expected to significantly increase the level of sophistication of the capstone component, contributing both to the overall quality of the degree and to its research component.

*Annual Teaching Retreat for Core Course Faculty.* Since the first students entered the program, PoE has held an annual retreat at which core course faculty and invited guests discuss teaching approaches, innovations, problems and solutions. This has been so successful that provisional plans are being made for shorter discussions, perhaps on a quarterly basis, in between the annual retreats.

*Team-teaching workshops.* PoE has also begun discussions potentially involving OUE, CIDR, the School of Education, the Teaching Academy, the IGERT urban ecology core faculty and other interested units and faculty to hold a series of facilitated workshops on team teaching in general, and interdisciplinary team teaching specifically.

#### **4. STATE-MANDATED ACCOUNTABILITY MEASURES**

PoE's degree program is too young to have made changes specifically designed to improve these accountability measures. However, recent changes in the B.A. Admission Requirements should decrease the time to declaration of the major and the time to degree completion, and changes in the amount of overlap allowed between the PoE minor and a student's major may also help decrease time to degree and increase the total number of PoE minors. These measures to improve the efficiency of the curriculum and to broaden student options (App. C-2, 3) should also assist with retention.

Additionally, PoE undergraduates are working closely with the undergraduate advisers on several initiatives to foster community among PoE students, staff, and faculty. During spring 2002 a new Environmental Studies student organization will be launched, and the PoE Multipurpose Room will be reserved for blocks of time each week for "Student Resource" hours devoted to study sessions and student meetings. Creating various opportunities for students to interact with one another and with faculty and staff should help increase retention as students enjoy a greater sense of community and increased access to resources.

#### **5. CAREER OPTIONS**

PoE's broad-based interdisciplinary degree in Environmental Studies prepares students for a range of careers, including work in environmental consulting firms, non-profit organizations, governmental agencies, and businesses. The Environmental Studies program features many career-building opportunities such as service learning integrated into the core courses, opportunities for fieldwork and undergraduate research, and the senior Capstone Experience. For all PoE students, ENVIR 492, the Capstone Experience III Seminar, features career counseling, practice in writing resumes and cover letters, tips for interviewing, and strategies for transitioning from college to career.

For many PoE students, the Capstone Experience is a key stepping stone to their first professional position. For example, one spring 2001 graduate focused her capstone research on at-risk groups in the Washington Tri-Cities area during the years of beryllium use at Hanford Nuclear Reservation. Her environmental health research experience helped her secure a position after graduation with the Centers for Disease Control in Atlanta. Another spring 2001 graduate completed an internship with the City of Mukilteo's Planning Department and subsequently secured a full-time planning position in the same office. A PoE Minor whose capstone project was creating a demonstration garden to show the use of biosolids in gardening now works with the Northwest Biosolids Management Association. While not all PoE graduates will link their first career position so closely to their capstone work, the Capstone Experience clearly plays a vital role in helping students define their career goals, test the waters in certain fields, and begin developing and honing professional skills.

In addition to supporting the career building aspects of the Capstone Experience, PoE undergraduate advisers also play an important role in providing students with career resources and information. They create handouts listing websites for environmental career planning, stock the PoE library with key environmental career publications such as the *Environmental Career Opportunities* bulletins and publications of the Environmental Careers Organization, post internship and job opportunities on the PoE website and to the Environmental Studies student listserv, and regularly meet with students to review resumes, cover letters, and job applications. PoE advisers also work closely with the Environmental Careers Organization to remain up-to-date on current trends in environmental fields, and with the UW Center for Career Services to publicize career workshops and resources and to participate in opportunities for career counseling training.

## **B. GRADUATE CERTIFICATE PROGRAMS**

Graduate Certificate programs represent a focused approach to expanding the breadth of students enrolled in disciplinary graduate degree programs; they provide institutional support and recognition for interdisciplinary education and collaboration; and in many cases they teach students to work in teams and provide valuable experience in incorporating findings and perspectives outside their discipline.

PoE led the development of a revised Environmental Management Certificate program and now provides its academic home. In cooperation with the Graduate School it provides administrative and program development support for two additional graduate certificate programs: Conservation Biology Policy and Global and Environmental Chemistry. In addition, PoE supports a proposal pending before the Graduate Council that would establish an interdisciplinary Certificate program focused on the Science and Policy Dimensions of the Earth Sciences. If approved, the program would receive administrative support from PoE.

### **1. Graduate Certificate in Environmental Management (EM)**

#### **a. Mission and Learning Objectives**

The Mission Statement for the Environmental Management Certificate program states:

The certificate program in Environmental Management is intended to provide education/training for a diverse array of graduate students preparing for management careers in the non-profit, for-profit and public sectors and in public-private partnerships, as well as those who will contribute legal, scientific and technical expertise to environmental decision making, locally, nationally and internationally. As a certificate program, rather than a freestanding degree program, the EM Program is designed to complement the great disciplinary strengths already provided by individual schools and departments of the UW. The target audience includes students from professional degree programs, as well as those from diverse science and engineering programs.

The learning objectives of this program closely mirror those of PoE itself:

- Understand the multiple values and cultural perspectives behind environmental issues confronting the modern world, nationally and internationally.
- Develop skills and models for identifying, understanding, communicating with and working with diverse stakeholder groups.
- Understand the contribution that science and technology can make to the interpretation and resolution of environmental issues.
- Understand the goals and methods of the public, private and non-profit sectors, and the ways that these can be harnessed so as to contribute to the development of a sustainable society.
- Understand the impact of environmental issues on businesses. Understand the impact of business activity on the environment. Understand models for integrating environmental and economic goals.
- Understand the roles and capacities of the public, private and non-profit sectors, and their interactions in the real world.
- Understand the principles and power of strategic thinking, life cycle analyses, and other means for achieving long-term, multiple-objective issues management.

A full description of the EM program is provided in App. C-4. A few adjustments in the program's curriculum have been made in the intervening years; the current requirements are given in App. C-5.

The Steering Committee (App. P-1) represents the three academic components of the EM Program: policy, business, and science as applied to decision-making. Jacqueline Meszaros (Bothell Business Program) and Marc Hershman (Director, School of Marine Affairs) have previously directed the program, and currently Alison Cullen (Evans School of Public Affairs) directs it; the Director is an *ex officio* member of the PoE Board. As the academic home, PoE is responsible for funding the Program.

#### **b. Benefits to PoE, University and Region**

PoE led the effort to redesign the EM Program after the Business School, where the program originated, decided to terminate the program. This was PoE's first venture into graduate

environmental education, and established the model of PoE serving as a centralized source of administrative support for interdisciplinary environmental programs irrespective of where their formal academic homes reside. This role allows PoE to perform an extremely useful and highly valued coordinating and information-distribution function without the need for a highly structured university-level organization.

During the redesign process for the EM Program a focus group of some 20 representatives of major regional businesses, government agencies, and not-for-profit organizations was convened to assess the need for the program as well as desirable design features. This meeting, as well as the experience of graduates holding the certificate, indicates that there is widely perceived value in the training it provides. Among the skills noted by employers as most desirable were the abilities to communicate, to work in teams, and to learn new specializations while on the job. This reflects the view we hear frequently from managers in Federal agencies, that it is becoming increasingly important for their technical staff to be able to share perspectives, and indeed a common language, with policy analysts and decision makers who must constantly balance multiple perspectives and stakeholder positions including those of the business community. The learning objectives of the EM program strongly emphasize these skills, and the curriculum design places great emphasis on developing them.

One particularly valuable feature of the EM Program has been participation by the Environmental Technologies Commercialization Corporation (an affiliate of the Battelle Institute) in teaching the business component of the curriculum. Gretchen Hund, Senior Research Scientist at Battelle, contributes both major teaching time and wide professional expertise in technology commercialization. She provides extensive one-on-one mentoring of student project teams. Moreover, senior research staff at Battelle volunteer to serve as a mentor for each project team. This collaboration not only adds tremendous value to the students' training but also demonstrates the value the business sector places on that training.

The participation by ETC<sup>2</sup> has produced tangible benefits for the students, and has been particularly rewarding for several individual students. One student has parlayed the capstone project into position as CEO of a start-up company actively working to bring to market the technology evaluated as part of the Business course. Another student has extended the analysis of end-use of contaminated harbor sediments into a master's thesis project. Other students have been appointed as interns in private sector companies seeking to commercialize the technologies, and several students have found the course and projects so rewarding that they have enrolled in the course for an additional quarter. These examples demonstrate the effectiveness of the approach in bringing students together into interdisciplinary teams that work hand-in-hand with both academic mentors, and public and private sector partners.

### **c. Measuring Success**

Assessment and monitoring have been a priority since appointment of the Graduate Program Coordinator. Our assessment efforts have included:

- A program review conducted with the assistance of the UW Center for Instructional Development (CIDR) in Spring, 2001;

- Ongoing exit interviews of graduating students for feedback and critique of the program;
- Quarterly review of student evaluations and monitoring of program requirements and electives.

The program review conducted in Spring, 2001, showed a high level of satisfaction among the students and especially high appreciation for the level of interdisciplinarity that it represents. Students cited as especially beneficial the exposure to fields outside the home discipline, interaction with student and faculty from other fields, and greater appreciation of alternative perspectives. The principal shortcoming identified in this review was the limited sense of community.

To build on the recognized strength while addressing the perceived weaknesses, the EM Steering Committee has undertaken a major review of curriculum, coupled with an assessment of how well the individual components are working. Sub-committees of the Steering Committee are actively working to refine the core courses to make them more closely integrated; to incorporate continuing themes that thread through the core courses; and to more effectively unite the EM students into a cohort who experience the program together. In addition, the EM seminar has been reformulated into a coherent, thematic course that addresses one key topic and is structured as a hands-on, interactive seminar to more fully engage the students with the speakers and with each other.

Approximately 25 graduate students are now enrolled in the EM Program, and the size of the group has increased steadily since the Graduate Council approved the new program. Students' home units are divided roughly evenly between science departments and the two policy schools. A full description of the current cohort is given in App. P-2.

The EM Program is clearly on an upward trajectory. The main difficulty has been maintaining a strong business component in the face of the Business School's withdrawal from the program. Several individual faculty from the Business School have contributed a great deal through courses (particularly the course involving ETC<sup>2</sup>), service on the Steering Committee, and supervision of student projects; there are other links with the Business School as well. We have also developed close ties with the Business Program at UW Bothell, where faculty and departmental interests and expertise more closely coalesce with the objectives of the EM program.

#### **d. Mentoring**

Certificate students are full-time graduate students enrolled in degree programs in academic units at UW. Therefore, their dissertation advisers and committees provide the bulk of their mentoring. Nevertheless, student mentoring is one of the strengths of the EM program.

Each student meets with the Graduate Program Coordinator to plan their program of study, and each student may designate a member of the Steering Committee as their EM faculty adviser. The Graduate Program Coordinator maintains regular contact with Certificate students and

distributes frequent announcements about program developments, on-campus events, professional activities and conferences, and career and employment opportunities.

Members of the Steering Committee, who place great emphasis on faculty–student and student–student interaction in course design, teach the core courses in Policy and Business. The program capstone completed as part of the Business core course likewise emphasizes extensive mentoring of student groups by the Business faculty and by external experts at Battelle.

#### **e. Career Options**

Because this is a certificate program and not a degree, and is completed at an unpredictable time relative to degree completion, it is difficult to track the career lives of the graduates. Nevertheless, the Graduate Program Coordinator invests a great deal of energy in monitoring career options and using that information in program planning with students (App. P-2), and has instituted a preliminary system to monitor placement outcomes for graduates of the program. The information on career options plays a role in the evolution of program design.

The graduate students who have taken the certificate in conjunction with an advanced degree in science, engineering, policy, or social science have largely done so because it substantially broadens the range of positions for which they are qualified. Although we have only a small number of graduates to date, several have stated that their placement in positions after graduation was facilitated specifically by their completion of the EM certificate. Here is an example:

“I wanted to let you know that one of the reasons [they] decided to interview me in the first place (even though they were not looking to hire anyone) was my diverse background. That background comes from the EM program. So, if you ever need someone to help persuade others to join, I would love to help out. I almost did not get the certificate, since I knew I would be so incredibly busy with my thesis; but I am so glad I changed my mind and stuck it out. My winter and spring quarters were pretty grueling - full load of classes, TA, and thesis.

Thanks for all your help and to the EM program for giving me the background I needed.”

## **2. Graduate Certificate Program in Conservation Biology Policy (ConBio)**

The academic home of the ConBio Program is the Graduate School, not PoE. However, the Graduate Program Coordinator serves this program in much the same way as he serves the EM Program. The Steering Committee is listed in App. P-3.

### **a. Mission and Learning Objectives**

The ConBio Program is designed to prepare students for a career in the interdisciplinary field of Conservation Biology Policy. Conservation Biology is an evolving field developed in response to the accelerating loss of species and habitats, along with the many resources and services that

biological systems provide to humanity. Its goals are to investigate human impacts on biological diversity and to develop practical approaches to mitigating those impacts.

Especially because the goals of Conservation Biology are so applied, basic studies in population dynamics, reproduction, invasive species and other aspects of biology must be synthesized with elements of many other disciplines including, among others, anthropology, sociology, economics, policy and law. The ConBio program was designed to provide students with practical knowledge and skills to enable them to work effectively with biologists, politicians, economists, lawyers, developers and others both in academic and in public life to address issues of biological resource conservation. Many of its students are doing dissertation work in other countries and help to enhance the international perspective of the program.

### **b. Benefits to PoE, University and Region**

The University of Washington is one of the premier research institutions in the country in the field of Conservation Biology and faculty in a wide range of departments teach courses related to conservation biology. Faculty in Zoology, Marine Affairs, Forest Resources, Oceanography, Public Policy, Botany, Economics, Anthropology, Animal Psychology, and other academic units at the university maintain active research and graduate teaching programs in issues of conservation biology.

Many of these faculty members have been active in conservation biology for many years. Until very recently, however, there was no organized curriculum that specifically addressed conservation biology as part of its name, and prospective graduate students interested in Conservation Biology had no clear program with which to seek affiliation. In 1997, under the leadership of Professor Dee Boersma, the Graduate Certificate in Conservation Biology Policy was established to fill this programmatic gap by drawing on the considerable academic strength existing throughout the University.

The Conservation Biology Policy Certificate program:

- leverages existing faculty expertise and departmental facilities to provide a certificate in Conservation Biology Policy for students in a wide range of disciplinary degree programs at modest administrative expense.
- provides a mechanism for coordinating curriculum across departments and colleges.
- serves as a public face for the wide-ranging and high-impact research and teaching contributions of distinguished faculty in many units across UW.

### **c. Measuring Success**

In the spring of 2001 the Graduate Program Coordinator, based on the more thorough analysis of the EM Program conducted in association with CIDR, conducted an informal assessment of ConBio. The outcomes of the two studies were similar: great satisfaction among students with the interdisciplinary nature of the program, a desire for more consistency in course offerings, greater clarification of options for fulfilling requirements, and greater cohesion and community among ConBio students and faculty. To help increase student interaction with faculty we have

instituted an annual reception for new students and faculty, and have considered inaugurating a quarterly seminar in Conservation Biology.

Likewise, the Graduate Program Coordinator surveys graduating students about the benefits and successes of the program, and areas for improvement. The number of responses to date has been small, but universally positive.

The size of the program has more than doubled since its affiliation with PoE; it now has 18 students (App. P-4). In addition, the Steering Committee has resumed discussions about a ConBio Science component of the program to parallel the present emphasis on ConBio Policy. Both the rising enrollments and the faculty's interest in broadening the scope of the programs are positive indicators for the future. A new resource for this area is the establishment of an endowed chair in Conservation Biology in the Department of Zoology. Discussions about how this new thrust might interface with the ConBio certificate program are about to get under way.

#### **d. Mentoring**

The mentoring process is much like that for the EM Program.

#### **e. Career Options**

The demand for students with training in Conservation Biology has grown dramatically over the past decade. Career paths fall into three major sectors: the private sector (examples are timber and land management companies, planning and consulting firms, real estate investors), government (e.g., Department of Interior, state wildlife and natural resources agencies, city and county planning departments), and non-profit organizations (e.g., Nature Conservancy, National Wildlife Federation, World Wildlife Fund, and the like). The proliferation of professional and academic organizations (such as the Society for Conservation Biology, International Association of Landscape Ecology) and journals testify to the growing prominence of Conservation Biology as a discipline.

As part of our mentoring and outreach, the Graduate Program Coordinator monitors employment prospects related to Conservation Biology and distributes selected announcements to Conservation Biology Certificate students. In addition, PoE has recently agreed to host the Puget Sound Conservation Biology Jobs listserv. The listserv is open to anyone interested in Conservation Biology, but provides a valuable and centralized repository of career, research, and service announcements related to conservation biology.

The Graduate Program Coordinator has instituted a program to track placement outcomes of graduating students.

### **3. Graduate Certificate Program in Global and Environmental Chemistry (GEC)**

The GEC Program was developed to provide interdisciplinary but highly technical training for students interested in areas such as atmospheric chemistry, chemical oceanography, the global carbon cycle, biological processes in sediments, and others for which the most expert faculty are

scattered among a number of units including Atmospheric Sciences, Oceanography, Chemistry, Microbiology and others.

Last year the University funded a new Program on Climate Change (PCC) through the UIF process. There is significant overlap in goals and faculty affiliation between GEC and PCC. Therefore, GEC is currently going through a redesign process under the leadership of Prof. Mark Benjamin (Civil & Environmental Engineering) with the support of Prof. Jim Murray who founded GEC and now directs PCC. It would be premature to anticipate the outcome of these discussions. In the meantime, GEC students continue to be guided and supported by Prof. Murray and the PoE Graduate Program Coordinator.

#### **4. Interdisciplinary Program in the Science Policy Dimensions of the Earth Sciences.**

This is a new program designed to bridge the barriers between the earth sciences and the social sciences and policy, spearheaded by Prof. Edward L. Miles of the School of Marine Affairs and Chair of the TFEE. At this point it is a Graduate Certificate Program of novel design, basing each student's work on a contractual agreement involving the student's home department in one of the natural sciences and a department in a complementary discipline in the social sciences. With the understanding that a mirror-image program (home department in one of the social sciences, complementary department in the natural sciences) will be designed as the next phase, this program is now before the Graduate Council for consideration. If approved, the program will be housed in the Graduate School but added to the cluster that is supported by the Graduate Program Coordinator in PoE.

PoE has a historical association with the development of this program. Co-Directors Mike Wallace and Johnny Palka participated in the discussions that led to its design, and Prof. Miles initiated those discussions partly in an effort to satisfy a portion of the TFEE recommendations that had not been previously addressed. PoE was a co-signer on the proposal forwarded to the Graduate School.

## **VII. GRADUATE STUDENTS**

PoE has no graduate students in the usual sense. However, it employs graduate students from units as TAs, and serves as the academic home and/or administrative support unit for graduate students in three graduate certificate programs. The sections below reflect these relationships.

### **B. INCLUSION IN GOVERNANCE AND DECISIONS**

#### **1. Inclusion in Governance**

Graduate students serve as members of the Governing Board of PoE (which also includes undergraduates) and of the Steering Committees of the Graduate Certificate Programs, although there have been some time gaps in student representation. As important, graduate students (and undergraduates as well) serve on all working groups associated with PoE, which is where most program design and review is done.

#### **2. Grievance Process**

PoE has had no formal, internal grievance process. We have had only two cases that could be characterized as grievances.

a. A TA who felt that her views on relevant course material had not been heard fully by the course faculty. A lengthy conversation with the Co-Directors resolved the issue.

b. An applicant for a TA position who felt that he had suffered discrimination on account of age. Discussion was not effective and a formal complaint was lodged with the Equal Opportunities Commission. PoE handled this issue through Human Resources and the University Complaint Investigation and Resolution Office have submitted the University's response; the Office considers the complaint to be completely without merit.

We are now in the process of developing policies that will ensure that all graduate students affiliated with PoE understand what mechanisms they have recourse to in case of a grievance of any sort.

### **C. GRADUATE STUDENT SERVICE APPOINTEES**

#### **1. Appointment Process**

Every TA position is advertised widely through e-mail distribution lists maintained by the Graduate Program Coordinator. Information about the course content and goals, and about qualifications required for the position, is included in the announcement. The Administrator collects applications. Selection from among the candidates (typically 10-20 per position) is

conducted by the course faculty on the basis of a review of the written applications and interviews with a short list of candidates.

## **2. Average Duration of Appointment**

Appointments are made for only one quarter at a time. Because course content is so different from one core course to the next, it would be very unusual for a single graduate student to be the top applicant for two quarters in a row. However, in a few cases the same person has been selected for two iterations of the same course in successive years.

## **3. Mix of Funding**

Because PoE has no faculty and no major grants in its own name, virtually all appointments are to TA positions. During the development of some key courses, graduate students have been appointed as RAs to assist the faculty in course preparation.

## **4. Criteria for Promotion and Salary Increases**

Not applicable because PoE has no graduate students of its own.

## **5. Supervision**

TAs work very closely with the faculty. Their principal role is to teach discussion sections in which specific topics are discussed in an expanded form, quizzes are administered, case studies and student presentations are prepared, and service learning is integrated into the course. There is at least one preparation session per week, and the TAs contribute to the detailed planning for upcoming segments of the course.

## **6. Training**

Because TAs are appointed on a quarterly basis, PoE has no training program of a general sort. Each new set of TAs is introduced to the PoE staff, and to the space and facilities they will be using. As described above, there is very close working contact with the teaching faculty and systematic preparation for particular tasks; this in itself constitutes effective training. This is outstandingly true when graduate students serve as RAs in the course design process.

PoE's TA positions are highly competitive. As a result, virtually all candidates selected already have substantial teaching experience and their work with PoE builds on a solid base rather than requiring introductory training. The significant number of repeat applications we receive indicates the value to the graduate students in the teaching they do with PoE.