Name of Program: Graduate Program in Environmental Science and Policy

Department Chair: Professor Patricia A. Terry

Date Report Completed: 1/23/2008

Date of Last Program Review: Spring 2000
Section I. Mission Statement

Briefly state your program’s mission. Indicate how it relates to UW-Green Bay’s core and select missions and guiding principles.

The mission of the Environmental Science and Policy Graduate program is 1) to prepare skilled and imaginative problem solvers for positions in government, non-profit organizations, academic institutions, and private industries and 2) to provide persons with knowledge and understanding of both science and policy formulation so they are able to effectively analyze and address environmental challenges. See Appendices A and B.

This mission reflects the Select Mission of UWGB (Appendix C) by providing an interdisciplinary approach to environmental challenges and a problem focused educational experience that prepares students to think critically in addition to serving as an intellectual resource.

It reflects the Core Mission of the University by offering a graduate program in Environmental Science and Policy at the master’s level, promoting scholarly activity, integrating with the Office of Outreach and Extension, supporting activities designed to promote the economic development of the state, and offering an environment that emphasizes teaching excellence and meets the educational and personal needs of students.

The Environmental Science and Policy mission relates to the University’s Guiding Principles by 1) providing an integrated experience that challenges students to think critically, develop communication and quantitative skills and to become productive citizens, 2) maintaining an academic program that strives for excellence, serves the needs of the region and also seeks national prominence, 3) fostering a diverse, but collegial community of faculty and student scholars who value life-long learning, and 4) supporting both basic and applied research that attempts to strengthen community support and national awareness of the program and the university.
Section II. Program Curriculum

Provide a description of components of your curriculum, e.g., laboratories, internships, program-based student organizations, lecture series, etc. that you feel are not adequately described in the catalog. Recent changes in program requirements that are not reflected in the current catalog description should also be provided here.

The Environmental Science and Policy program curriculum, given in appendix D, consists of a core of three courses which all students must take. The first, Perspectives in Environmental Science and Policy, is taken in the first fall of a student’s enrollment in the program. The graduate seminar is taken at the midpoint. The final course, Seminar in Environmental Science and Policy, is considered the capstone course in the program and is usually taken close to the end of a student’s graduate career. This course is an integrative problem oriented experience in which students from all three emphases work on a single project encompassing policy, planning, and science aspects of an environmental challenge. Because of the nature of the ES&P program, both the Perspectives and Seminar in Environmental Science and Policy classes are co-taught by faculty from environmental policy and planning and environmental science.

In addition to these three courses, all students must choose one public policy oriented course from a block and one science oriented course from a block. Each student, with the exception of those enrolled in the BS/MS Integrated Program, must complete 6 credits of thesis, while they are conducting their thesis research and writing their thesis document. The Integrated Program is discussed below. This thesis is the culminating experience for all students. Students in the Integrated Program must only complete 2 credits of thesis, although the research and thesis expectation are the same.

Beyond this core requirement, each student must choose one of three area of emphasis, Ecosystem studies, Resource Management, or Environmental Policy and Administration. Each of these has its own set of required courses and electives that a student must use to fulfill another 15 credits of coursework. To graduate, students must have a total of 34 credits, with the exception of the Integrated Program students, who need only 30 total credits. A description of each area of emphasis and required/elective course lists for each is provided. Few students follow the exact course of study as outlined in the catalog. With approval of the graduate program chair, students are allowed to substitute internships, independent study experiences, transfer credits, and other relevant courses as electives to meet their individual needs.

The BS/MS Integrated Program, Appendix E, is a new opportunity that allows UW-Green Bay undergraduate students to begin working on their graduate degrees in ES&P, while still completing their undergraduate degrees. Ideally, a motivated student, who enters as a freshman able to take Math 104 in the first semester, can potentially earn both degrees within 5 years. For student pursuing a BS degree in Environmental Science and a MS degree under either the Ecosystems Studies or Resource Management emphases, a sample plan is included. This program requires a change to UW-Green Bay policy on the number of graduate credits a student may take prior to completion of the undergraduate degree. The allowed number is now 15 graduate credits. Early admission requires a commitment from an ES&P faculty member to be the thesis advisor for the student. All other graduate program requirements for admission, minimum GPA and GRE scores, must be met.
Section III. Issues Addressed Since Last Review.

Describe how your program addressed the issues raised in the last review. If any issues were not addressed, please explain why they were not.

The following recommendations and observations, shown in italics, were made in the Academic Affairs Council program review of the Environmental Science and Policy Graduate Program, Appendix F. Their report was submitted May 17, 2004, to Dean Fritz Erickson, Dean of Professional and Graduate Studies. The report followed assessment of the Self Study report submitted by Dr. John Stoll, then Chair of the ES&P graduate program.

The ES&P program continues to require a thesis. Faculty members serving on committees, but not as chairs, often receive no compensation for their service. Faculty members who chair six thesis committees earn a reassignment, but only after the theses are completed. This sometimes results in heavy burdens for faculty, with no way to address the burden during the time it was most significant. A faculty member who chairs several committees and sits on several more has no way at the time this work is performed to reduce his/her workload. As mentioned in the last program review, "Thesis advising should be credited during the advising process." Since nothing has been done about this in the interim, the AAC strongly recommends that the program take a look at this.

First, this is an administrative issue that is not under the direct control of the ES&P program and no attempt has been made at the university level to change this.

Second, due to severe budget cuts to the graduate programs made in the past three years, the ability of the graduate program to compensate faculty for service on thesis committees has worsened. Now, not only are thesis committee members still not compensated, thesis chairs also receive no compensation. The directive that was handed to the chairs of the respective graduate programs was that thesis reassignments for faculty, who have chaired six completed theses, would be given only if money were available in their undergraduate program's budget to fund them. This shifts the burden for funding thesis compensation to the Natural and Applied Science, Human Biology, and Public and Environmental Affairs undergraduate programs. These programs struggle already with meeting the demands of their undergraduate majors and are unprepared to economically subsidize the graduate program. All of these programs have also suffered from budgetary cuts in the past few years, which essentially means that there is no funding available to compensate faculty. In addition, the course release for the chair of the ES&P graduate program has also been lost, such that the present chair is fulfilling the responsibilities of the graduate chair, in addition to some duties that once were performed by the eliminated position of the Associate Dean of the Graduate Program, while carrying a full course load. To say that this lack of compensation for graduate faculty has had a negative impact on faculty morale would be an understatement. Several faculty members have relinquished graduate faculty standing, while others have reduced or eliminated the number of thesis and other graduate program committees on which they serve. The result is that it has become more difficult to carry out the work required to keep the program functioning and a greater burden must be carried by fewer active members.
Some professors seem to take on more of a load vis-a-vis the number of thesis committees they serve on and/or the number of thesis committees they head. The AAC encourages the graduate faculty to be more vigilant about not burdening some graduate faculty members more than others.

Partially because of the above mentioned budgetary restraints discussed above, this situation is difficult to remedy. Despite low morale among ES&P graduate faculty, some members continue to be champions of the program, willingly making a disproportionately heavy contribution, in service to thesis committees and other service committees for the program. Unfortunately, others contribute only minimally. Minimally contributing faculty are encouraged to step up their participation. However, since faculty are evaluated for merit primarily on their contributions to undergraduate programs at UWGB and since there is no compensation for serving the graduate program, there is little incentive to carry additional work load associated with the graduate program. Until the university addresses the issue of compensation, this situation will not change.

A few attempts have been made to alleviate this situation, but they admittedly fall short of making a real difference. When a new student is admitted to the program, he or she is assigned an initial advisor based upon expressed area of research/emphasis interest. An attempt has been made to distribute these as evenly as possible, however, research interests of students tends to lead to discrepancies in faculty assignments. Students also tend to gravitate towards faculty they have as instructors in their first year. One possible solution, which has been tried for the past two years, is to have a wider array of faculty teach the Perspectives, ENV S&P 710, class. Another solution that has had limited success is to use the Perspectives class as a forum for faculty interested in taking on students to present their current research and projects.

In the last year, the BS/MS Integrated program has been created with one desirable outcome being that of having faculty who desire additional graduate students to work in the faculty's area of research recruit the best students from UWGB undergraduate programs to continue their graduate work at UWGB, specifically for that faculty member. Faculty members, who serve as advisor for as many students as they can manage, encourage interested students to speak with a colleague about their research. Fall 2007 is the first year of this new program, so the effects are yet to be observed.

Another problem is a possible disconnect between ES&P graduate students interested in the sciences and those interested in public policy. Some students noted this during the assessment process. On the one hand, some students have science backgrounds while others have backgrounds in politics, public policy, etc. Sometimes it may seem as if these two groups of students, who have different knowledge bases, are using different vocabularies and thus are having some trouble communicating. The AAC encourages the ES&P faculty to investigate ways to ease this tension, especially in the Perspectives course, which introduces students to the program, and the capstone Seminar in Environmental Science and Policy, where students research significant issues of local or regional scale from multiple perspectives.

This disconnect illustrates the value of this graduate program to society at large. This disconnect exists in the professional, nonacademic world and is often the cause of the mismatch between scientific knowledge and public policy. The ES&P program attempts to solve this disconnect by having both science and policy students interact in the classroom and on projects in the hope of minimizing any disconnect once these students enter the nonacademic world. Faculty members who teach the Perspectives and Capstone classes have added team projects, such as mock hearings, that get students working together.
almost immediately. However, the loss of 9 out of 17 teaching assistantships, including all of the policy course teaching assistantships, has worsened this disconnect by causing a decrease in the number of policy students in the program. With relatively few policy students and virtually no way to recruit top students from out of state, it has become more difficult to achieve the central purpose of the ES&P graduate program. It is difficult to achieve integration when the majority of the students are in the two science emphases and that these students are less likely to include policy faculty on their committees. Core courses in the Environmental policy and Administration tract are also suffering from low enrollment, such that periodicity has had to be decreased. Fewer offerings of policy courses only continue to serve this disconnect.

Previous solutions to this challenge have been to have both the Perspectives and Capstone courses co-taught by faculty in science and policy. The co-instructors learn from each other, modeling cross-disciplinary collegial respect to the students. In the perspectives class, the students analyze a number of common readings that represent the many perspectives and disciplines involved in science and policy. This is done to create, as much as possible, a common knowledge base and language. In the capstone course, as stated above, students work collaboratively to form a set of recommendations on an environmental challenge relevant to society, either local or global. This set of recommendations addresses both the science and the public policy considerations of the particular issue. Having the students work collaboratively, allows the students to model the multidisciplinary approach that would create better environmental solutions if applied outside academia. Hence, we embrace the frustration in academia, with the hope of minimizing it outside academia.

The AAC respects the ES&P faculty’s recent decision to reject a non-thesis option for students whose career interests and skills may not fit with a thesis requirement. The AAC nonetheless encourages the faculty to give some thought to possibly revisiting this discussion in the near future.

The issue was briefly revisited with the same decision to require a thesis for all students.

The AAC encourages the Environmental Science and Policy graduate program to investigate ways to enhance faculty development efforts.

Nothing has been done in this area for the reasons described above. Faculty may participate in faculty development efforts that are available to all UWGB faculty members and staff.
Section IV. Assessment of Student Learning.

a) Student Learning Outcomes. List your program’s anticipated student learning outcomes. What do you expect all students to know or be able to do?

Six learning outcomes were listed in the Fall 2000 Program Development Plan. They are:

1. Knowledge specific to the area of emphasis in which the student has specialized: Ecosystems Studies, Resource Management, Environmental Policy and Administration. In some cases this may be a personal program of study.

2. Understanding of the complex nature of environmental problems and the interrelated roles of science, administration, politics, policy, and technology in their solution and in the formulation and implementation of environmental policy.

3. A working knowledge of the biological, chemical, physical, political and administrative processes and techniques affecting environmental quality and related issues.

4. Ability to contribute to the environmental policy and science research base, to access this research base, and to assess quality of the research literature.

5. Ability to think creatively and to identify potential solutions to current and emerging problems, and to evaluate the technical and economic feasibility of such solutions.

6. Ability to design and implement research strategies, collect, organize, and evaluate data, and produce written reports of professional quality, including hands-on skills in using computers to achieve these objectives.

Specific to the Ecosystems Studies and Resource Management emphases as listed in the graduate catalog (Appendix G):

1. design and conduct scientific investigations
2. collect, evaluate, and interpret data
3. make responsible decisions to implement appropriate technologies and strategies to solve environmental problems
4. effectively communicate the results of environmental studies to other scientists, decision makers and the general public.

Specific to the Environmental Policy and Administration Emphasis as listed in the graduate catalog (Appendix G):

1. identify and analyze policy-relevant problems of major importance
2. collect, assess, and interpret policy relevant data
3. design, evaluate, and implement strategies and programs for addressing such problems
4. effectively communicate the results of policy analyses and evaluations to diverse audiences, including environmental scientists, policy makers, and the general public.
b) **Assessment Methods.** Describe all of the methods used by your program to assess the student learning outcomes listed above.

**Thesis evaluation form: (Appendix H)**
This form is completed by faculty members on a student’s Graduate Thesis Committee. It is administered at the end of the thesis defense when the faculty members have both read the thesis and heard the oral presentation.

**Capstone Course Survey: (Appendix I)**
This form is completed by students in the ENV S&P 763 course, Seminar in Environmental Science and Policy. This course, as described earlier, offers students the opportunity to work collaboratively in completing a project that includes both policy and science aspects. The students enrolled in the course represent all three emphases and should make recommendations to the issue they consider that reflect all three emphases.

**Capstone Review:**
At the end of the ENV S&P 763 course each fall, the co-instructors write a review of how well the students met the learning outcomes of the graduate program in completing the particular project chosen. Recommendations for the next year are always included.

**Exit Survey:** (Appendix J)
The Office of Graduate Studies administers an exit survey as students are seeking final approval of their graduate thesis. This is done after the thesis defense has been successfully completed and the student has submitted a final copy of the thesis to the Office of Graduate Studies for final review and inclusion in the campus library.

A post graduation survey (Appendix K) is conducted by the campus placement office and the Office of Graduate Studies has also conducted periodic surveys.

c) **Summary of Results.** Summarize the results and conclusions you have drawn from the evidence collected using the assessment methods described above.

**Thesis evaluation forms: (Appendix H)**
Review of the thesis evaluation forms for students defending and graduating during this review period indicate that faculty serving on thesis committees feel that overall theses were of high quality and that students have met the learning outcomes of the program. Several faculty have shared that no all students are easily led through the thesis completion process and that some of their writing skills are below the expectation for graduate students. Greater attention should be given to the GRE writing score when students are admitted and to the written TOEFL score for foreign students.

**Capstone course surveys (Appendix I)**
The capstone course surveys completed by the graduate students for the past few years indicate some overall strengths and weaknesses of the course and the graduate program.

**Strengths:**
The project format has the potential to integrate science and policy and allows students the opportunity to apply what they have gained from the graduate program. It also teaches students how
to work effectively in diverse groups with minimal faculty guidance. Students felt the real life projects provided an example of the way large agencies and/or the industrial sector need to work cooperatively.

Weaknesses:
The weaknesses reported by the students varied each year and were somewhat dependent on the instructors and chosen project. Overall the biggest weaknesses and criticisms were given by the students in the Fall 2004 Capstone class. The students felt that a project was chosen for them that did not meet the interest or expertise of the majority of the students and that was outside of the expertise of the faculty instructors (Terry and Phoenix), such that the faculty were not able to meaningfully help the students reach a final product. This criticism has since been addressed by allowing the students to choose and define the project. Students feel that the project scope and objectives should be more predetermined by the faculty. They also recommend that rather than grade a single large report at the end of the semester, the instructors should have mid-semester and other periodic deadlines to better assess each students' contribution and guide the overall process.

A continuing student complaint over each semester is that any papers read and written reviews should pertain to the project. Otherwise, they create more work with little learning value that places an undue burden on the students.

Capstone reviews: (Appendix L)
Reviews of the capstone class are provided (see attached) for the Fall 2004, Fall 2005, and Fall 2006 semesters by the course instructors. Highlights for each term are as follows:

Fall 2004 (Terry and Phoenix)
The course format was changed from previous semesters to have the textbook and readings correspond to the project. This created a more meaningful and streamlined workload for the students without compromising the integrity of the course. There was a great deal of frustration among the students over the group project and an unusually high level of personality conflict that inhibited the group dynamic. Based on this Terry and Phoenix recommended that, in the future, the instructors should communicate to the students the expectations for the class and the project and that students be given more voice in choosing the project and more guidance over the semester.

Fall 2005 (Kraft and Fermanich)
The instructors suggested a number of possible topics to the students and allowed the students to choose and define their project from these. Students were pleased that they had a voice in determining the project, but were also concerned that the length of time it took to choose and define the project reduced the time to complete it. The instructors initiated discussion of project topics as early as Spring 2005 and met with students planning to enroll in the course during this time, which expedited the process. The five student work groups drafted separate reports, rather than integrate the reports into a single unified document. This was seen as an improvement. Also, instead of assigning a text for the course, the instructors placed a number of selected articles on library reserve and chose other articles pertaining to the project for review and discussion. It was recommended that readings pertain to the project and not duplicate those from other classes. It was noted that not all students were equally proficient and interested in the course, a long standing issue for the capstone instructors. However, given the diversity of students, the instructors felt that the goals were met. One strong outcome was that the university administration implemented some of the recommendations made by the students concerning campus sustainability.

Fall 2006 (Terry and Phoenix)
In keeping with the recommendations made in the past two years, students chose and defined the project. In addition, no readings other than those chosen by students to supplement the project were
assigned. Students were still expected to lead discussions and write reviews of papers. The project that was chosen grew from the work of the previous year as a result of conversations held in the spring prior to the fall term. Mid-semester deadlines were given to assess and guide the process throughout the semester. The result of these changes was an experience that was much more positive and meaningful than in the Fall 2004 term. The overall project and oral report were of a high quality and even resulted in implementation of some of the campus sustainability recommendations by campus administrators.

**Exit Surveys (Appendix J)**

Exit surveys for the past few years were reviewed and averaged and show the following result:

Students ranked the following statements on a scale of 1 (strongly disagree) to 7 (strongly agree) and averages are presented.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Aver. response</th>
</tr>
</thead>
<tbody>
<tr>
<td>If employed, your present position is in a field relevant to your course of study within your degree program.</td>
<td>6.0</td>
</tr>
<tr>
<td>Your MS degree from UW-Green Bay helped you in your professional development.</td>
<td>6.4</td>
</tr>
<tr>
<td>The coursework in your program prepared you to function as a professional in your field.</td>
<td>5.4</td>
</tr>
<tr>
<td>The topics discussed in the courses were relevant and current.</td>
<td>6.0</td>
</tr>
<tr>
<td>The professors in your program were professional.</td>
<td>5.7</td>
</tr>
<tr>
<td>The professors were up-to-date in their fields of expertise.</td>
<td>6.0</td>
</tr>
<tr>
<td>The professors in your program were available.</td>
<td>5.7</td>
</tr>
<tr>
<td>Your thesis or project was a worthwhile learning experience.</td>
<td>6.6</td>
</tr>
<tr>
<td>You advisors provided adequate guidance.</td>
<td>4.9</td>
</tr>
<tr>
<td>On a personal basis, the time and energy that you spent on your master's degree was worthwhile.</td>
<td>5.9</td>
</tr>
<tr>
<td>Overall, my graduate program was an excellent experience.</td>
<td>6.0</td>
</tr>
</tbody>
</table>

Students were also asked what they liked the most and least about the ES&P graduate program. Common answers are given below.

**What did you like the most about the graduate program from which you received your degree?**

The faculty, guidance and support from faculty, small classes so that everyone had an opportunity to participate, TA financial support, other graduate students, resources such as the biodiversity center

*What did you like the least about the graduate program from which you received your degree?*

Repeated materials in the perspectives and capstone classes, lack of availability of professors, lack of guidance from thesis advisor, need more TA and RA opportunities, need more internship opportunities, cover more global issues as opposed to local ones
d) **Uses of results.** Describe and provide specific examples of how you have used the assessment results to guide program planning and decision making.

The outcomes assessment methods discussed above have led primarily to changes in the Capstone graduate course. While each pair of faculty who teach the course ultimately make decisions as to how to best approach the goals of the class, a few modifications have been made by all. First, the students must be given a strong voice in the choice of the project that each class addresses and the way that each project is approached, such as one unified report or several separate ones. The readings and other written assignments for the class are optimally tied to the project and selected by both the students and the instructors. Finally, midterm deadlines and assessments are important to a successful final result.

The assessment of the thesis evaluation forms has led to a greater awareness of the importance of strong writing skills and the writing skills score of the GRE must be given great consideration in the admissions process. The written TOEFL score is likewise important in the consideration of foreign students for the program. It is probably necessary to refer graduate students to the university writing center to reduce the load on the thesis advisor in helping the student produce a good final product.

The exit surveys told us that, for the most part, faculty were perceived as doing a great job teaching students, but that we need to make sure that the needs of all students are addressed. While student comments were strong on faculty helpfulness and expertise, faculty providing guidance was the lowest ranked of the list of statements. In addition, the capstone and perspectives courses were seen as too often redundant. This has been addressed by a curriculum committee, discussed in the next section of this report, to assess the needs and goals of the two classes and make recommendation for curricular change. Faculty availability was noted to be a problem in some students listing of what they liked least. Graduate faculty members concur with this student concern, but expressed valid concern that graduate program duties are performed on top of undergraduate duties with no compensation for the time required to mentor graduate students on their thesis work. This will continue to present a challenge until faculty members are compensated for their time via release time, etc.
Section V. Accomplishment of Program Goals.

For each area below describe the projects and initiatives completed by your program since its last review to meet you program development goals.

a) Curricular Modifications. For example, addition or deletion of courses or areas of emphasis; new majors or programs; course development and improvement including pedagogical changes and the use of instructional technology; accreditation by an outside agency.

Curriculum committee (Appendix M)

A committee of six ES&P faculty met between December 2004 and February 2005 to consider the ES&P curriculum including course descriptions, the Capstone and Perspectives classes, existing courses and requirements, cross-listed courses, course prerequisites, the thesis requirement, and areas of emphasis within the program. The following recommendations were made.

The three areas of emphases (Ecosystem Studies, Resource Management, and Environmental policy and Administration) meet the goals of the program, especially given our flexibility to devise individual programs of study for each student.

Insofar as student demand and departmental resources allow, cross listed courses should be replaced with full graduate offerings where possible. When cross listed classes are offered on a twice a year basis, we should try to make one of then an evening graduate only course. (Note, a lack of resources has limited implementation of this recommendation.)

Because graduate students in cross-listed courses do not have to meet the same prerequisites as undergraduate students in the same course and come from varied undergraduate backgrounds, each instructor should add to the course description and syllabus a statement about the desired level of preparation for satisfactory completion of coursework.

A brief survey form (see Appendix I) was developed to assess student opinion of the capstone course. It was administered in the Fall 2004 course. Student comments were consistent with the formal course evaluations given at the end of the semester. The results were used as discussed to make curricular changes to the capstone course.

A committee was convened to consider a non-thesis option for the ES&P graduate degree. Consensus was that successful completion of a thesis was necessary to achieving the learning outcomes of the program. The possibility was left open to revisit the matter in the future if program needs and expectations change.

New Programs: Emergency Management Planning and Administration (Appendix N)

The Office of Outreach and Extension at UW-Green Bay created a 15 credit certification program in Emergency Management Planning and Administration to meet the growing needs of the community for such expertise. The program was initiated in Spring 2005. The ES&P graduate program voted to allow the five courses offered in this certification to be taken for graduate credit in the same way that cross-listed courses are taken for graduate credit. This has created another potential
area of expertise and employment for ES&P graduates while maintaining the core requirements and outcomes of the program. A brochure for the program is attached.

New Programs: Integrated BS/MS Program (Appendix E)

A new program that would allow highly qualified UWGB undergraduate students to begin taking courses and performing research relevant to the MS degree in ES&P while in their fourth undergraduate year was initiated in the Fall 2007 semester. The goal was to recruit strong UWGB undergraduates into the graduate program and allow them early admission to the program. This program maintains the present university requirements for both the BS and MS degrees, so no curricular changes were required. Starting with their freshman year, an ambitious student could earn a master’s degree after five years. Creation of this program required a change in university graduate program policy that would allow undergraduate students to take as many as 15 credits of graduate work prior to completion of the undergraduate degree. Admissions policies, policy regulating enrollment in undergraduate classes, and tuition and financial aid were addressed in the development of this program. A complete description is included as an attachment.

New course: Environmental Data Analysis (ENV S&P 755)

The ES&P program requires a quantitative class to complete the degree. Students often chose to meet this requirement by taking Applied Regression Analysis, Multivariate Statistical analysis, or Design of Experiments, courses really intended for undergraduate math majors. Although these courses supplied the necessary quantitative background for students to complete their thesis projects, they were often difficult for graduate students without a strong preparation in math and statistics. In 2001, a new quantitative course, Environmental Data Analysis, was introduced. The class incorporates aspects of the undergraduate courses with examples using environmental data. A major goal of this course is to provide the student with the basic skills needed for successful completion of the thesis project. It also provides a strong foundation for more in depth statistical coursework if the student wishes to pursue that option. The course is offered every fall.

b) Procurement of Resources. For example, additional faculty or staff positions, expanded laboratory space, research grants and other extramural funds.

There have been no additional faculty or staff positions added since the last program review. One faculty member in biology has resigned her position effectively June 2008 and it is hoped that the position will be filled with a colleague of similar (limnology) expertise to fill the void.

A second position has been lost, via promotion to the LAS Dean, from the Policy and Administration faculty. As currently planned, his replacement is likely to have little connection to the ES&P program, further shrinking the ability of PEA faculty to serve the graduate program. It might be possible to recruit this faculty replacement in the area of emergency management and international environmental policy and administration, which would serve the ES&P program, but the decision is not within the influence of the ES&P program.

The Laboratory Sciences building was renovated between 2002 and 2004 and was reopened in the Fall 2004 semester with expanded lab spaces for the sciences. A few large equipment additions were made at this time to support research and instruction.
ES&P faculty have been active in obtaining research grants to support student research. Funding sources have included, but not been limited to, Wisconsin Focus on Energy, Sea Grant College Program, US Forest Service, National Science Foundation, US Environmental Protection Agency, UW-System Solid Waste Research Program, National Oceanic and Atmospheric Administration, and Wisconsin Department of Natural Resources. ES&P faculty have been among the most productive on the UWGB campus in grant and contract procurement. Many of these have supported graduate research assistantships leading to MS thesis topics for students. (Appendix O)

Two new research assistant positions, Barbara Hauxhurst Cofrin Graduate Research Fellowships in Environmental Science and Policy (Appendix O), were procured that will be awarded in the Spring 2008 semester to begin supporting students in the Fall 2008 term. These competitive RA positions offer $10,845 per year in support with another $3687 in benefits.

c) Faculty and Staff Development. For example, teaching skills improvement opportunities; support of faculty research and other scholarly activity; renewal and retraining; enhancement of instructional technology skills; attendance at conferences, retreats and workshops.

The ES&P program, as with the other MS programs on the UW-Green Bay campus, has no budgetary resource to sponsor faculty development activities explicit to the graduate program. Graduate program faculty members are dependent on their undergraduate disciplinary units in Natural and Applied Sciences, Public and Environmental Affairs, and Human Biology to support such activities. These units have been supportive of faculty development activities in both pedagogical training and research/scholarly activities due to the complementary relationship of the undergraduate programs in these disciplines with the graduate program.

Support of faculty research in the graduate program has actually diminished in this reporting period due to the loss of thesis reassignments for faculty and the chair reassignment. The earned thesis reassignment should come after a faculty member has chaired six theses, but has not been given for several years due to budgetary cuts. The reassignment is for one course to allow the faculty member to catch up with scholarly activities that were sacrificed by the time requirement of mentoring graduate students. The burden of supporting these has fallen to the undergraduate units, which are also unable to fund them due to budget constraints within their own programs.

d) Student Advising. Efforts your program made to enhance the quality of academic advising for students who have declared a major in your program.

Each student who is admitted to the program is assigned an initial advisor according to the research interest of the student. The student may speak with that faculty member or the program chair to set up their first semester course load. In addition, the ES&P graduate program website includes program requirements and a list of faculty and their areas of expertise and interests. One addition to the fall semester Perspectives in Environmental Science and Policy course has been an early semester "How to Succeed as a Graduate Student" panel to acclimate students to the expectations of graduate students and how to maneuver through the system to chose a thesis topic, complete the thesis and graduate. Throughout the semester, ES&P faculty present their current research to the students in the perspectives class to introduce them to the faculty and help them chose an area of research for their thesis. The program also has a 1 credit required course, Graduate Seminar, in which the process o:
completing a thesis proposal and choosing a thesis committee is covered. Ideally, students should leave this course with a completed proposal.

e) **Plan 2008.** (Appendix P) Your program’s efforts to implement the recommendations made in the institution’s Plan 2008. Goals 2, 3, and 5 are of particular relevance to academic programs. A complete copy of this plan can be found at http://www.uwgb.edu/univcomm/news/diversity/2008rprt.pdf.

**Goal 2:** Increase the number of faculty, academic staff, and administrators of color in proportion to their availability in relevant job pools.

The graduate program desires greater diversity, but have little participation in the decision making process associated with acquiring new faculty positions and filling them. Faculty are hired and appointed to undergraduate budgetary units with an expectation of commitment to the graduate program, but are not hired directly by the graduate program. Thus, issues of faculty and staff diversity must be addressed by undergraduate budgetary units. During this reporting period six faculty positions with graduate program expectation have been lost due to promotion, retirement, institutional elimination of position, decision to resign graduate faculty status or failure to earn tenure (Troy Abel, Ron Stieglitz, Mike Morgan, Jeff Necola, Michael Hencheck and Scott Furlong). Another is retiring as of the end of the Spring 2008 term (Tara Reed). Seven faculty have to date been added to the graduate program (Atife Caglar, Amy Wolf, John Luczaj, Mathew Dornbush, Mike Zorn, Angie Bauer-Dantoin, Dan Meinhardt). Of these, Amy Wolf, Atife Caglar, and Angie Bauer-Dantoin have increased the program’s gender diversity, despite the loss of Tara Reed.

**Goal 3:** Close the gap in educational achievement by bringing graduation and retention rates for students of color in line with those of the student body as a whole.

Because of the high cost of non-resident tuition, the ES&P program traditionally has had few students of color outside of native-Americans. These numbers have declined in the past two years because of the loss of 9 of 17 supported teaching assistant positions that were accompanied by resident tuition waivers. Statistics from the UW-Green Bay Office of Institutional Research show that between the years of 2001 and 2004 no students of color graduated, and that in each of 2005 and 2006 one student of color graduated. For these two years, this represented 6% and 7% of our graduating students, percentages that are consistent with the representation of students of color in the program. During this same reporting period, females represented on average 54% of the program graduates, also consistent with the percentage of female students enrolled in the program. Thus, while our numbers of students of color are low, their graduation and retention rates are comparable to the total ES&P enrollment.

**Goal 4:** Increase the amount of non-loan based financial aid available to needy students.

Due to budgetary cuts made for the 2007-2008 fiscal year, only 8 of 17 original graduate teaching positions have been retained. These positions were accompanied by some benefits and a tuition waiver allowing non-residents to pay resident tuition. The loss of 9 of these positions has had a severely detrimental effect on the recruitment of students of color because out-of-state and foreign students can rarely afford non-resident graduate tuition or pay resident tuition and support themselves without the financial aid of teaching assistantships. Two new competitive research assistantships are
being offered for the Fall 2008 semester, but a net loss of 7 funded positions remains, which will reduce the ability of the program to recruit students of color.

Goal 5: Foster institutional environment and course development that enhances knowledge of and respect for racial and ethnic diversity.

All courses in the ES&P program address specifically issues pertaining to environmental science and policy. Only where culturally and ethnically diverse ideas of the environment and policy toward environmental protection are discussed is respect for racial and ethnic diversity a factor. While not directly related to racial and ethnic diversity, the many disciplines and diverse faculty represented in the program requires an environment of respect.

f) Other proposed initiatives. These could include unit sponsored internships, student organizations, workshops and lecture series, etc…

Marketing campaign (Appendix Q)

One initiative that was carried out for the January to December 2007 year was greater advertising of the program. To reach both national and international prospective students, an enhanced web advertisement was carried on www.gradschools.com, the most frequently read website for prospective graduate students. Via this site, increases in requests for information and increases in applications were observed. Unfortunately, the budgetary source for this ($4000/year) was not continued. Another advertising initiative was done to target regional institutions with undergraduate programs that would be a good feeder for the ES&P graduate program. Advertising posters were designed, printed and mailed to over 100 institutions. To support both of the above initiatives, a new program website was designed and put online. Both the www.gradschools.com and the posters referred students to the new website.

Costa-Rica and Panama travel courses (Appendix R)

Two travel courses have been initiated in the past three years by ES&P faculty, one to Panama and one to Costa Rica. While both of these experiences are housed in undergraduate budgetary units, the courses may be taken for graduate credit by ES&P students and have the potential to create avenues of thesis research for students. See attached descriptions of each course with affiliated faculty.

g) Summary of accomplishments. Briefly summarize how successful your program has been in accomplishing the goals listed in your most recent Program Development Plan.

The most recent program development plan was performed in 2000 and included as an attachment. The ES&P program has addressed the issue of fluctuating enrollment via improved marketing and the Integrated program to attract a stronger pool of applicants and better mesh student interest with available faculty expertise. There has, however, been a decline in enrollment due to the loss of 9 teaching assistant positions.
Hiring of faculty in undergraduate budgetary units has, as much as possible, taken into account the needs of the graduate program. A number of faculty have retired in the past reporting period and recruitment efforts have been successful in retaining the many areas of expertise on which the program depends, most likely because of the parallel natures of the undergraduate programs in PEA and NAS with the graduate program. The ES&P has seen a broader array of expertise by inclusion of more faculty members from the human biology undergraduate unit.

The curriculum committee has reconsidered the goals and curricula for the capstone and perspectives courses and made appropriate recommendations. This will continue to be an ongoing process.
Section VI. Additional Resource Needs

a) Describe any new instructional equipment, instruments, computer hardware and software, and other items, that will need to be obtained over the next five years to meet your program goals.

At present there are no new pieces of equipment, instruments, or technology related items that would be needed solely by the graduate program.

b) List in priority order and in bullet form, any ongoing needs with a succinct rationale and dollar estimate for each need. Examples of unmet needs are increases in S&E or student help, ad hoc sections that exceed the provisional funds allocated for additional instruction.

1. Reinstatement of the thesis reassignment for faculty thesis advisors.

As stated previously, ES&P faculty members no longer receive the one course load thesis reassignment that is supposed to be given after successfully mentoring 6 graduate students through the thesis process. Based on the number of student in the program and the number of ES&P faculty, approximately three faculty members each year are eligible for thesis reassignment. This would cost 1/9 the salary of each eligible faculty, ranging between $5000 and $8000, depending on the faculty member. Total cost, based on an average of the high and low salaries, would be about $20,000 per year.

2. Reinstatement of lost TA positions (Appendix S)

The ES&P program has suffered from the reduction of funded TA positions from 17 to only 8. See Appendix Q for complete TA job descriptions. First, the undergraduate programs and faculty, particularly in PEA, have been compromised by the elimination of key teaching assistant positions that serve large enrollment undergraduate courses. The undergraduate introduction to statistics course in NAS and all NAS courses requiring field trips have lost key teaching assistants. This places a burden on both undergraduates who benefit from TA help and faculty who have done their best to make up the loss. This loss has also necessitated reorganizing undergraduate classes that were supported by TAs and has resulted in an increase in ad-hoc instructors and overload hours for the undergraduate programs. The graduate program has suffered because the TA positions were accompanied by in-state-tuition waivers that made it possible to recruit a more diverse pool of students both internationally and within the United States. A decline in foreign student enrollment has been observed as a result. There are also fewer students enrolling in the Environmental Policy and Administration tract of the program because there are no TA positions to support these students. Each teaching assistant is paid $10,845 plus benefits ($3687). The annual cost of reinstating all 9 lost positions is $14532 per TA or $130,788, but this cost does not factor in the savings that would be realized due to reduced ad-hoc instruction and overload hours.
3. Thesis committee stipend

While faculty serving on thesis committees do not make the huge time commitment that thesis advisors experience for each student, there is nonetheless a significant time associated with service on thesis committees. Because each student requires a committee of 3 graduate faculty, most ES&P faculty members serve on one to ten committees at a time, for which they deserve compensation. Approximately 12 students defend and graduate each year. ES&P faculty feel that a $750 stipend per graduating student is reasonable compensation for service on committees. The annual cost would be approximately $27,000.

4. Marketing and promotion budget (Appendix O)

The ES&P advertisement that was carried on www.gradschools.com along with the posters that were designed and sent to appropriate undergraduate programs resulted in increased interest in the program, better recruitment, and higher enrollment. The annual cost of maintaining a marketing program is $5000.