Environmental Science
External Review

March 21-22, 2011

Prepared By:

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Submitted April 25, 2011
I. Introduction

The team of external reviewers (Dr. Steven Kohler of Western Michigan University and Dr. David Smith of Smith College) arrived at Western Carolina University on the evening of Sunday, March 20, 2011, and met with stakeholder groups the following two days. WCU's internal member of the review team (Dr. Robert F. Mulligan) met the external reviewers for dinner on Sunday evening and brought them to the Stillwell Building the next day.

On Monday, the team met for breakfast with Provost Dr. Linda Stanford and Assistant Vice Chancellor for Planning and Effectiveness Dr. Melissa Wargo. After breakfast, the team met with Environmental Science Program Director Dr. Laura DeWald. The discussion with Dr. DeWald included a tour of the program facilities. Most of the laboratory facilities are not special to the ES program but are provided by other departments or programs as support.

The team next met with the Environmental Science Executive Committee (without Dr. DeWald, who normally chairs the Executive Committee) consisting of: Dr. Mark Lord, Head of the Department of Geosciences and Natural Resources; Dr. Cynthia Atterholt, Head of the Department of Chemistry and Physics; Dr. Peter Bates, Program Coordinator for Natural Resource and Conservation Management; Dr. Beverly Collins, Associate Professor of Biology; and Phillip Kneller, Associate Professor, Environmental Health Program, College of Health and Human Services. The team met for lunch with a group of current ES students and ES alumnus Preston Jacobsen, Sustainability Technician at Haywood Community College in Waynesville, North Carolina.

After lunch, the team met with department heads and program directors of cooperating departments supporting the ES program: Dr. Cynthia Atterholt, Head of the Department of Chemistry and Physics; Dr. Mark Lord, Head of the Department of Geosciences and Natural Resources; Dr. Sean O'Connell, Head of the Department of Biology; and Dr. Peter Bates, Program Coordinator for Natural Resource and Conservation Management. The team next met with the deans of the colleges which support the ES program: Dr. Wendy Ford, Dean of the College of Arts and Sciences; Dr. Marie Huff, Dean of the College of Health and Human Sciences; and Drs. David Butcher and Niall Michelson, Associate Deans of the College of Arts and Sciences.

After an afternoon work session, the team toured the Undergraduate Research Expo and viewed and discussed the poster presentations of six ES majors: Kindra Foy, Austin Brooks, Paul Purnell, Jill Wiggins, and Jennifer Smith, "Perceived vs. Actual Recycling among Students at WCU" (ES 495); and Jacob Sinclair, "Fuel Consumption and Emissions Comparison of Current and New Panamax Ships" (ECON 310). The team then had dinner at Lulu's in Sylva with Drs. Beverly Collins and Mark Lord.
The team met for breakfast on Tuesday with Associate Vice Chancellor for Planning and Effectiveness Dr. Melissa Wargo and David Onder of the Office of Planning and Effectiveness. After lunch the team had an exit interview with Dr. Melissa Wargo, David Onder, Dr. Laura DeWald, Dean Dr. Wendy Ford, Dr. David Butcher, Dr. Niall Michelsen, Dr. Marie Huff, Dr. Marie Huff, Provost Dr. Linda Stanford, and Associate Provost Dr. Beth Tyson Lofquist.

II. Analysis of the Program

a. Undergraduate ES Program

i. Curriculum. The B.S. in Environmental Science is an interdisciplinary, science-oriented environmental degree that provides majors with comprehensive breadth in the natural sciences; exposure to relevant topics in the social sciences; upper-level training in quantitative, field and laboratory methodologies; and a sequence of guided electives. The major is ‘book-ended’ by introductory ES courses (ES 101, ES 150) and a service-learning ES capstone course (ES 495). The B.S. requires 69 hours in the major (29 hours in core courses, 3-4 hours in Geographic Information Systems, 3 hours in Environmental Health, 3 hours in Environmental Policy, 3 hours in Environment and Society, 3 hours in Quantitative Methods, 4 hours in Field and Natural Environmental Science, 3-4 hours in Analytical Science/Instrumentation, and 18 hours of upper-level science electives, chosen from a list of Biology, Chemistry, Environmental Health, Geology, Math, and Natural Resource Management courses) OR any upper level course at WCU with approval of their advisor and inclusion in their approved two-year plan. The actual number of general elective hours varies from 9-24 because up to 13 hours in the program may satisfy Liberal Studies requirements.

A unique feature of the program is that students prepare two-year plans outlining their junior and senior year courses of study in each of the fields outlined above, including the upper-level science electives. Each of the non-core areas offers a choice of several approved courses, and there are also a variety of approved courses from which the students may choose the 18 hours of upper-level science electives. The Environmental Science Executive Committee (ESEC) must approve the students’ choices of courses for each non-core area and the upper-level electives.

ii. Student body. ES majors are primarily Caucasian (97%) and male (65%). While the racial uniformity may mirror that of WCU as a whole, the greater proportion of males does not reflect the overall female-to-male ratio (52:48) at the university. A significant number (14/23) of ES graduates are transfers.

iii. Planning and Assessment Strategies. The Environmental Science Program is transitioning from a newly created academic major to a more mature and established one. The goals and learning outcomes of the ES program are appropriate to the university’s strategic mission and to its students’ interests and career preparations. Several stakeholders stressed the need to improve the implementation of assessment measures. Because only 3 ES courses exist, course evaluations can provide only a narrow window through which to view the program’s success. To its credit, the ES program has initiated
its own periodic assessments of the curriculum, and the ESEC faculty participate in planning and assessment. Earlier assessments have led to constructive changes to the major (e.g., moving ES495 from spring to fall). There appear to have been no attempts to propose new ES courses or request additional faculty since the program’s inception. The self-study is primarily reflective, and the external reviewers did not get a strong sense of where the ES program wished to go in the near-term or long-term.

b. Graduate program.
Not applicable

III. Analysis of Faculty
a. Qualifications
The Environmental Science Executive Committee (ESEC) oversees the major. The ESEC includes the only faculty member at WCU who has an appointment in ES (50%). The remainder of her appointment is divided between the Biology (25%) and Geoscience and Natural Resources Department (25%). The ESEC shares advising responsibilities with the ES faculty member. Dr. DeWald still does all summer orientation advising. A large percentage of ES students are transfers from other institutions. There was widespread praise for Dr. DeWald and members of the Executive Committee concerning their advising.

The ES self-study included vitas for Drs. DeWald (ES Program Coordinator), Bates (Natural Resource and Conservation Management), Kneller (Environmental Health), Lord (Geology), Collins (Biology), Martin (Biology), Byrd (Environmental Health), Davis (Natural Resource and Conservation Management), Huffman (Chemistry), Ogle (Environmental Health), Tanner (Geology), and Zontek (Environmental Health). The faculty who support this program are very well-qualified with significant research accomplishments. The present composition of the faculty meets the needs of the curriculum reasonably well. The faculty who teach in this program are clearly motivated individuals who voluntarily support the ES program and display a strong interest in working with undergraduate students on research projects, independent studies, etc. We were impressed by the uniformly positive appraisal of the faculty by current ES students and alumni.

b. Resources and Support
i. Tenure and Ranking Procedures. The ES Program Director previously underwent three annual faculty evaluation and tenure/promotion/retention (AFE-TPR) reviews (Biology, GNR, ES program) – a cumbersome and needlessly stressful arrangement. The new ES AFE-TPR document, which specifies one evaluation committee for the Program Director, is a decided improvement. The rest of the ESEC faculty are evaluated within their home departments, and these evaluations apparently do not include their contributions to the ES program.

ii. Faculty compensation. The external review members did not evaluate faculty compensation for the ES Program Director or ESEC faculty.
iii. Library holdings and access. Library holdings and access appeared adequate.

iv. Faculty lab space and resources. The ES Program Director indicated that much of her research is conducted in labs in other departments. She showed us a small research lab space that she had recently acquired. The research space appeared small and sparsely equipped.

c. Teaching, Research/Creative Activity and Service
The ES Program Director has maintained an admirable level of scholarship, creative activity, and service, particularly in light of her split teaching and service responsibilities among departments and the administrative burden of running the ES Program. Her colleagues and the university clearly recognized the strength of her accomplishments by promoting her to full professor this year.

Based on the vitas provided, ESEC faculty are professionally active and productive, as shown by their publications, grants, participation in professional meetings, both national and regional, service to professional organizations, and project involvement.

IV. Analysis of Operational Facilities and Budget

a. Adequacy of facilities
The ES program was recently provided a room for students to meet and work and an adjoining office for the ES Program Director. Beyond these spaces, however, ES majors and the Program Director are dependent on other departments and programs for access and use of facilities. Administrative support is currently housed in the Chemistry and Physics department. While these arrangements make efficient use of existing departmental and program resources, they do have the potential to limit ES majors. For example, affiliated faculty may be less inclined to sponsor interdisciplinary work that falls outside of their disciplinary interests, particularly as demand for research experiences by undergraduates grows.

Existing facilities, field and lab equipment, software, and supplies in affiliated departments and programs that teach ES students appeared adequate.

b. Adequacy of budget
The budget for the ES program is modest (~$9,500) and covers a student wage, purchased services, supplies and equipment. The affiliated home departments or programs absorb most expenses for ES majors.

V. Summary of Strengths and Areas of Improvement

a. General impressions of the program
For a very young program (7th year of existence), it is performing very well and appears to be on track to becoming a mature, well-functioning interdisciplinary program. There has been steady growth in the number of majors, and all students we met (~25% of the
majors) had very favorable impressions of the program. They all seemed to be very engaged and enthusiastic, and the overall quality of the students was impressive.

The curriculum is solid, and has some unique features relative to other environmental science programs, which we will discuss below under “areas of strength.” Two of the three ES foundations courses (ES 150 and 495) provide a well-designed introduction to the program and capstone experience, respectively. Student evaluations of both courses were very positive.

The ESEC has done a good job of designing and supporting the major to this point, but its level of enthusiasm for the program at our meetings was difficult to gauge. It may merely be that ESEC members are normally reserved, but we were uncertain whether ESEC members viewed the ES program as competing with their own departments for scarce resources, support, and student enrollment, or whether other unspecified tensions existed. At present, the program presents minimal cost to the affiliated programs, which ESEC members represent. However, with increased growth of ES, competition with other units, especially the NRCM program, for students could intensify. Some students commented that they felt some competition among programs for students already existed. Accordingly, we examined fall-to-fall retention data for ES and NRCM provided by David Onder to determine if there was any support for the idea that students left ES for other programs. Between 2004 and 2009, 36 students entered the ES program and 21 (58.3%) were retained in the program from one year to the next year while 28 (77.8%) were retained at the university. Therefore, 7 (19.4%) of the students left the program and remained within the university. Data for the NRCM program are very similar. Fifty-five students entered the program between 2004 and 2009, and 33 (60%) were retained in the program from one year to the next year while 43 (78.2%) were retained at the university. Therefore, 10 (18.2%) of the students left the program and remained within the university. Thus, both programs are losing students to other majors at WCU, and more detailed analysis would be needed to help identify the causes and directions of such shifts.

Generally, students seemed very satisfied with the ES major and said they felt empowered by this interdisciplinary course of study. When we asked students what improvements could be made to the ES major, they gave a range of responses. Among them were: a greater emphasis on sustainable technology; a dedicated space for the program; more visible opportunities for research; more chances for independent study and internships; and more encouragement and opportunities to take environmental economics.

b. Strengths of the program
A clear strength of the program is the program’s Director, Dr. Laura DeWald. Despite having only a half-time appointment to the program and significant teaching commitments elsewhere, her level of energy and engagement in ES is extraordinary. It seems clear that ES’s development and continued growth is strongly dependent on her vision, organization, and commitment.
A second major strength is the quality and breadth of academic training provided by the program’s curriculum and participating faculty. Several features of the curriculum are worth noting. First, the environmental health and natural resources/conservation components are relatively unique for environmental science curricula, and should help to set the program at WCU apart from potential competitors (an important advantage over, e.g., Appalachian State’s program, which does not have either component) and attract students. Second, the capstone course does a very good job of integrating skills learned during the program in a real world problem-solving setting. Third, the sustainability theme for the program is relevant, popular, and meaningful. Finally, the two-year plans force students to focus on career objectives at an appropriate time, and can provide a tool for assessment activities.

c. Areas for improvement
Here we will briefly touch upon areas where improvements or changes in the program could be made. We will elaborate on these in the next section.

Continued growth in the number of majors is needed to meet the UNC Criteria for Academic Program Productivity for a Bachelor’s program. The number of students entering the program per year has not changed appreciably since 2005 (mean = 7.5 students/year) and needs to be at least 10/year to sustain on average 10 graduates/year. In addition to attracting more students, it would be helpful if the year-to-year retention rate could be increased. Given the limited enrollment and retention data we examined for the ES and NRCM majors, it is difficult to draw conclusions beyond observing that except to the extent these two programs compete directly for students, whatever strategies prove effective in improving retention for one will probably directly benefit the other.

There are three aspects of the curriculum’s structure that would merit attention. First, students in the program have ES courses together (i.e., as a cohort) early in the program and again for the capstone course, with nothing as sophomores or juniors. This makes it difficult to maintain a sense of community among ES students and discourages the development of a strong ES identity. Second, ES101 course does not appear to be serving its purpose. Currently, ES101 has the dual responsibilities of helping students: 1) identify environmental career options and 2) vet choices of environmentally oriented majors at WCU. The latter task seems to be an unnecessary use of limited time for the Program Director and could be accomplished, perhaps, through an intensive pre-orientation. We think a redesigned ES101 may be more effective as a 200-level course that would be taken just before the students develop their 2-year plans. Third, while the foundation and advanced courses collectively do an excellent job of providing students with quantitative/analytic skills and a natural science background, the curriculum may not fully prepare students for the sustainability projects conducted in the capstone ES495.

Other than the Director and the ES executive committee, participating faculty receive no official recognition and have no formal appointment to the program. One consequence of this is that, in descriptions of the program, the program appears much smaller than it really is. Changing this could promote student recruitment, and enhance both student and faculty identity and commitment to the program.
Outside of the capstone experience, there are few well-defined research opportunities for students. If faculty affiliated with the program were clearly identified it could help students find potential research mentors. It is not clear that students in the ES program have the same access to research opportunities as do students in other science programs at WCU.

Much of the program’s success hinges on the dedication and efforts of its Director, and the program’s identity is strongly tied to the Director. With additional growth, such a structure may not be sustainable, nor is it likely to be the optimal long-term configuration. In addition to formal (0% time) appointments for affiliated faculty, one or more additional faculty lines (or joint-appointments) and dedicated administrative support may be necessary to ensure the long-term health of the program.

VI. Summary of Recommendations

a. Mission and strategic vision of WCU

An important part of University’s Strategic Plan (January 2009) is that WCU expand its focus on education and research related to environmental sustainability. This is a wise choice. With many, if not most, environmental problems likely to worsen in the next half-century, there will be increasing need for well-trained, knowledgeable graduates in environmental fields. By strengthening and promoting the ES program, WCU will position its students to compete in job market and apply their environmental problem-solving expertise at local, state, national and international levels.

The strong interdisciplinary natural science and sustainability focus of the ES major already distinguishes WCU from other environmental degree programs in the UNC system. Another aspect that sets WCU apart is the existence of the College of Health and Human Sciences. Internationally, great effort is being devoted to studying the connections between population, health, and environment (PHE). The ES program should consider building its current ties with ENVH and strengthening the role of ENVH in the curriculum. For example, issues of environmental justice, environmental degradation, and human and ecosystem health are frequently intertwined. An enhanced focus on environmental justice may also assist in recruiting minority students.

b. Curriculum

We recommend that the ES program consider creating two new ES courses for the major and that it reexamine several existing courses or categories for possible changes. Below, we refer to the new category titles from the ES Self-Study.

i. New courses

The addition of two new ES courses would provide students: (1) greater continuity through the major, (2) a stronger sense of identity, (3) opportunities to develop general skills and sustainability themes, and (4) practice in integrative thinking. The latter point is particularly relevant to this major: taking courses in different, related disciplines does
not guarantee integration of knowledge across disciplines. Explicitly integrative courses could include a 200-level course as part of the ‘Science and Technical Foundation’ sequence and a 300-level course in the ‘Advanced Study in ES’ sequence.

200-level course. ES101 could be redesigned as a three-credit 200-level course that introduces students to seminal and current works in environmental science and sustainability (e.g., see Adelson et al. 2008. Environment: An Interdisciplinary Anthology; Orr, D. 1994. pp. 109-124 in Ecological Literacy. “A Prerequisite to the Great Books of Allan Bloom: A Syllabus for Ecological Literacy”). Such a course would give students increased opportunity to develop new learning outcomes #2-5 (reading and writing skills, understanding of basic human-environment relationships, etc.) described in the self-study. Career-path information, previously included in ES101, could be retained as part of the 200-level course. Older students would be better motivated for career-path discovery, and such information may help them formulate their two-year plan.

300-level course. A 300-level course could be designed to better prepare students for sustainability projects they will encounter in the capstone course and, eventually, in the workplace. Such a course might focus on information-gathering techniques and analytic methods that ES majors may not encounter in other, more discipline-specific courses (e.g., energy audits, life cycle analysis, modeling, ecological or carbon footprints, social surveys, etc.). This new course might be included as an additional requirement to satisfy either the Quantitative Methods Competency or Advanced Environmental Science Competency.

ii. Existing courses

Laboratory Competency. The exclusive focus on chemistry to satisfy the Advanced Study Laboratory Competency category was puzzling, given the disciplinary flexibility permitted in the other Advanced Study areas. Laboratory competency could be achieved by courses in other areas (e.g., molecular biology, microbiology, physics, etc.).

Social Science Competencies. Required courses in the social sciences are currently confined to the introductory Science and Technical Foundation sequence. The breakdown of ES SCH (pg. 11 in the self study) indicates that many ES majors are not using human-oriented courses (e.g., PAR, ANTH, SOC) to satisfy Upper Level Electives. One consequence is that ES majors may graduate well versed in scientific methodologies, but poorly prepared to deal with associated economic, social, and political considerations. One option would be to require an additional social science class at the Advanced Study level, perhaps in place of an Upper Level Elective. Several students indicated that they regretted not taking an environmental economics course as part of their major.

ES495 Seminar in Environmental Problems. The ES capstone is well designed, resonates with students, and meets the ES program’s goals admirably. If, as a result of the recommended new 300-level ES course, students come to the capstone with greater understanding of sustainability practices, they may accomplish even more than they have in the past and leave their ‘clients’ with a better product. The capstone may wish to use the campus as a ‘living laboratory’ for some sustainability projects. Finally, we sensed
that ES projects might have gravitated toward sustainability themes, in part, so as not to overlap with capstone projects in other majors, such as Natural Resources and Conservation Management. Whether true or not, ES capstone projects might benefit by occasionally coordinating with or dividing up projects conducted in NRCM or ENVH.

**iii. Assessment.** The addition of new ES courses to the major will provide more opportunities for program assessment than currently exist. Assessment can be structured in terms of the required ES courses, which offer opportunities to survey or measure student achievement and areas for improvement. A pre-measurement instrument administered in ES 150, combined with a post-instrument administered in the capstone course ES 495 would allow for assessment of informational/attitudinal deficits for students entering the program, the extent they were remedied by the program, and measure the program's value added.

Because most ES students take a uniquely tailored sequence of non-ES courses to make up the bulk of their ES program, the quality enhancement plan (QEP) offers a further opportunity to assess the program which can be applied to all students in the program. The QEP calls for each student to prepare a portfolio or "virtual briefcase" of artifacts demonstrating professional competencies, normally produced as part of graded coursework, together with an evaluative narrative by the student explaining how each artifact addresses the competency. An evaluation rubric could be developed to assess the extent each student's progress through the ES curriculum has contributed to their overall education and realization of QEP education goals. This would allow for program evaluation of the contribution of non-ES courses, because a substantial portion of the artifacts and evaluative statements in the virtual briefcase will be from non-ES courses. Though not a graded item, students' approved two-year plans and the accompanying evaluative statements should also be included in QEP virtual briefcases.

In addition to standard course evaluations and enrollment figures, program success could be gauged by other metrics, such as post-graduation employment and graduate school entrance statistics.

**iv. M.S. program in ES.** Until the ES major is better established and more fully resourced, a graduate program in environmental studies seems premature.

**c. Faculty resources**

**i. Affiliate faculty.** We recommend that faculty on the ESEC receive a letter of formal appointment from the administration in recognition of their service. Such recognition may provide greater incentive for junior faculty and associate professors to serve as well as a record that can be included in annual reviews and tenure and promotion considerations.

A process could be formalized whereby the ES Program Director evaluates faculty contributing to the program. These evaluations could also be reviewed and endorsed by the ESEC if desired. Evaluations would then be provided to faculty as feedback, and could be included in AFE and/or TPR dossiers at the discretion of the faculty being
This would reward faculty for participating and doing a good job, while providing constructive feedback where necessary and warranted.

Depending on the topics chosen, the ES program might wish to recruit professors from non-participating departments to assist in teaching the new ES courses. For example, a reading-based 200-level course could benefit by involving a literature, or perhaps philosophy and religion, professor with environmental interests. A sustainability-themed 300-level course could bring in an engineering or physics professor to help explain energy measurements.

**ii. Additional faculty.** We recognize that adding new faculty in the current economic climate is difficult. Nevertheless, we believe that the ES program requires another part-time, or ideally, full-time professor in ES. Professor DeWald’s efforts to build and maintain the ES program have been simply outstanding, but the burden for the program’s success should not fall largely on one person’s shoulders. Having one professor teach all the core courses in a major, no matter how good she or he is, is inadvisable. ES majors will benefit from different teaching and disciplinary perspectives. The ES program could seek a job candidate with an interdisciplinary degree to teach the integrative ES courses recommended in the sophomore and junior years. A growing number of candidates with interdisciplinary training, research, and teaching experience are on the market. The ES program might use this opportunity to recruit underrepresented faculty in the sciences through a target-of-opportunity hire. If a full tenure-track position is unavailable, the college could pursue short-term solutions, such as a post-doctoral fellow, a shared hire, or a faculty ‘buy-out’ from another department.

d. **Student recruitment, retention and graduation**
The ES program can improve student recruitment, retention, and graduation by providing: (1) better advertising and advising, with special attention to women and underrepresented groups, (2) more ES-specific courses (described above), (3) greater opportunities for student-student and student-faculty interactions, (4) virtual pathways through the major, and (5) a desirable physical location.

**i. Advertising and Advising.** The ES website, while informative, is sparse. With administrative or IT support, the website should be enhanced to list affiliated faculty and their research interests, courses that count toward the major (including non-ES courses), exciting class projects, invited speakers, internships, and upcoming events (e.g., http://www.science.smith.edu/departments/esp/). Pamphlets describing the ES program, generally, and courses that will be offered in the upcoming semester, could be developed and distributed during advising periods. Although more labor-intensive, a program newsletter, published once or twice a year, could showcase ES program activities and accomplishments internally and externally. Pamphlets or newsletters can be sent to high school guidance counselors, community colleges, and WCU’s Advising Center to direct prospective students to the ES program. Advertising and advising targeted toward women and ethnic minorities could help to increase their numbers in the major.
**ii. Interaction.** The ES program could create a greater sense of community by holding informal monthly lunchbags or by hosting an occasional high profile speaker. Lunchbag speakers could include environmental experts/potential employers from the area, faculty from affiliated programs and departments, staff from facilities management, or students returning from study away programs.

**iii. Pathways.** The ES program might wish to develop several virtual tracks through the major and post these on the website, so that students have examples from which to draw. These pathways could be geared toward particular careers or graduate programs.

**iv. Prerequisites.** As noted in the self-study, ES students are potentially at a disadvantage when taking upper-level courses in a particular discipline, because they lack prerequisites required of majors in that discipline (e.g., Biology requires two 200-level prerequisites). An analysis of grades of ES majors in upper-level courses yielded variable results (some students did well; others did not). As the number of majors grows, we recommend periodic reexamination of student performances to identify upper-level courses that truly demand certain prerequisites.

**v. ES space.** At present the ES director’s office adjoins the student space and her only access is through the student space. A separate entrance to the director’s office would be desirable. A visible location to display ES posters and other ES materials would also help to foster a sense of identity for the program and its majors.

**vi. Research opportunities.** Attention needs to be paid to making research opportunities more visible and available for ES majors. For example, some departments are already overwhelmed providing research experiences to their own students and, thus, may not advertise opportunities to ES majors. Because the ES program lacks its own research space and faculty (with the exception of the Program Director), ES students must seek out affiliated faculty and their labs. These faculty could make known their interest in involving ES students in their research and the types of opportunities available at appropriate times in the semester.

**e. Administrative structure**

The administration should examine the feasibility of moving the program director into a full-time position in a single department. This would facilitate allocation of an appropriate amount of dedicated lab and other support space for the ES program. Such a move should only be implemented if the department selected to house the ES program does not perceive this major as draining support and enrollment from other disciplines already housed in the department. Unqualified support from the department housing the ES program and program director is essential for the growth and success of the major.

The ES program may wish to re-examine the size and composition of ESEC as the major grows and as current members assume greater administrative responsibilities in their home departments/programs. In an effort to inject new ideas and also to spread advising responsibilities, the ESEC could consider adding 1-3 at-large members. If appropriate
recognition is given for committee service, then other interested faculty might be more inclined to participate. Membership on the ESEC need not be limited to, or primarily, department or program chairs.

The new AFE-TPR model should be employed in the event new faculty are added to the ES program. Guidelines for interdisciplinary hiring, tenure, and promotion can also be found at the Council of Environmental Deans and Directors website (http://ncseonline.org/CEDD/). Deans of the CAS and CHHS may wish to examine these recommendations.

f. Resources

i. Administrative support. Dedicated administrative support is needed if the ES major is to grow. A 0.5 FTE Program Director cannot be expected to handle additional recommended initiatives (e.g., website creation and maintenance, identification of internships, supporting new courses, marketing the program, budgets, lunchbag series, etc.) without such help. In addition, as the number of majors increases in the capstone course, more than one project and client will need to be identified in the preceding summer. An administrative assistant may be able to aid the Program Director in this task, or at a minimum, free up the additional, significant time necessary time to seek out projects.

ii. Budget. The current budget may need to be increased to support increased advertising and outreach and new ES-specific courses.

iii. Space. Dedicated workspace/lab is needed that is equipped with computers, large tables (e.g., to spread maps), and laboratory and field equipment and supplies. Students in the capstone course should have a place in which to gather and work that is not dependent on the good graces of other departments. This space could also be used for ES directed studies projects.

iv. Internships and study away. The ES program may wish to look for more internship and study away opportunities for their majors. Students expressed a desire for more local internships; perhaps some could be identified and supported to facilitate on-campus sustainability efforts. Other students clearly benefitted from study away programs (e.g., Australia, Highlands Biological Station) that counted toward their major. If the demand exists, WCU might wish to increase the number of students it can send to Highlands Biological Station from the current two.

g. Outreach

In its efforts to address pressing environmental problems, the ES program is likely to find a receptive and interested audience both inside and outside the university. The ES program should make its presence and activities known to WCU students and alumni and the local community through its website, newsletters, and press releases.
The ES program should consider joining the National Council for Science and the Environment (http://ncseonline.org/). The membership fee, typically covered by the College(s) or Provost, covers registration for faculty and students to the annual national meeting in Washington, D.C. and access to relevant publications. Meetings of NCSE’s Council for Environmental Deans and Directors are outstanding opportunities to discuss issues relevant to interdisciplinary environmental programs and to establish a national presence. Other organizations include the recently formed Association for Environmental Studies and Sciences (http://www.aess.info/).