2013
Department of Natural Resources and Environmental Science Periodic Program Review

Submitted December 2013

Self Study

Natural Resources and Environmental Science Bachelor of Science
College of Agriculture, Food and the Environment
Self-Study for Periodic Review, 2008-2013

Submitted by: NRES Steering Committee

NRES Steering Committee members:

Mary Arthur, Ph.D., Chair, NRES Steering Committee
Chris Matocha, Ph.D., Director of Undergraduate Studies
Carmen Agouridis, Ph.D.
Chris Barton, Ph.D.
Brian Lee, Ph.D.
David McNear, Ph.D.
Robert Paratley, M.S.
John Schieffer, Ph.D.
Andrew Stainback, Ph.D.

Submitted to: Dean M.S. Smith, College of Agriculture, Food and the Environment

Date submitted: December 1, 2013

Contents

I. Executive Summary:

The work of conducting and writing this self-study of the Natural Resources and Environmental Science (NRES) undergraduate B.S. program was undertaken with the goal of developing an objective and reflective assessment of the program to provide an effective framework for the review committee and the University of Kentucky College of Agriculture, Food and Environment (CAFE) administration to evaluate the strengths of the program and to assess the challenges the program faces. As faculty members of the NRES Steering Committee we have reflected on how well the program is serving our students, the capacity of the NRES faculty to be flexible and attentive to changing needs, and to anticipate future challenges. The NRES faculty members contribute to the program largely out of a personal and professional commitment, and work collaboratively to maintain and build this valuable and successful program. Overall, the program is functioning extremely well, with increasing student enrollment, strong student and alumni evaluations of the program, dedicated faculty and staff, and achievements by current students and alumni at UK and beyond. While there are key challenges ahead that stem from a combination of program growth and shrinking resources, the future is also promising because of the tremendous momentum among students, faculty and staff.

Self-study process:

This self-study was completed with the involvement of the NRES Steering Committee members, the NRES Academic Coordinator (Geri Philpott), and the NRES Student Assistant (Sarah Barney '14). The process relied on three primary sources of information:

(1) Surveys conducted of current students, alumni, faculty and chairs of NRES-affiliated departments.
(2) Data collected as part of university record-keeping (e.g., teaching evaluations of NRES courses, data on student success) and NRES record-keeping (e.g., internship sites, assessment).
(3) Engagement of NRES Steering Committee members and Academic Coordinator throughout the self-study process.

NRES Steering Committee members and affiliations:

Dr. Mary Arthur (Forestry), Chair, NRES Steering Committee
Dr. Chris Matocha (Plant and Soil Sciences), Director of Undergraduate Studies
Dr. Carmen Agouridis (Biosystems and Agricultural Engineering)
Dr. Chris Barton (Forestry)
Dr. Brian Lee (Landscape Architecture)
Dr. David McNear (Plant and Soil Sciences)
Mr. Robert Paratley (Forestry)
Dr. John Schieffer (Agricultural Economics)
Dr. G. Andrew Stainback (Forestry)

Progress since last self-study

The previous periodic review, and the subsequent implementation plan, covered three key areas:

(1) Resources: At the time of the last review, the NRES program did not have any dedicated staff or funds, but relied entirely on voluntarily provided resources from the supporting departments. Since the last review, the NRES program now has an Academic Coordinator, Ms. Geri Philpott, hired in June 2011 and a commitment from the current CAFE dean for

operating expenses of $15K per year. Physical space for program administration and academic pursuits remains a key deficit.

(2) Instructional, advising, and recruitment concerns: Previous reviewers identified a need to refocus the program to better educate students in environmental science and policy, to improve guidelines for advisors, and develop a more intentional recruitment plan. In 2009, following a deliberative process involving faculty and student input, we revised the curriculum significantly and changed the name to Natural Resources and Environmental Science. In 2012 we further revised the curriculum in response to newly identified needs and changing university-wide undergraduate education opportunities and constraints. We have improved our website presence to increase accessibility of all advising information. Since hiring the Academic Coordinator we have significantly expanded our recruitment efforts and increasing student numbers reflect those efforts. Our enrollment has increased from 57 students in 2007-2008 to 95 students currently. This is a 67 percent increase in enrollment in six years, and a 12 percent increase since the AC was hired. Approximately twenty-five percent of students are on the Dean's List for academic achievement.

(3) Work more closely with faculty and department chairs: This recommendation reflected a concern regarding commitments from department chairs and College administrators to provide faculty resources to maintain the NRES program. Since the last review, several faculty members were hired with either explicit or implicit expectations to provide instructional support to the NRES program. Nevertheless, this continues to be an ongoing concern, along with the concern that a small number of key faculty members keep the program operating and functional. Since the last review, we have worked to keep chairs of affiliated departments aware of the program through email, individual meetings, invitations to NRES events, and a yearly invitation to a NRES Steering Committee meeting focused on overarching issues. We have engaged a new department (Biosystems and Agricultural Engineering), and added curricular options that engage faculty in the Sustainable Agriculture undergraduate program in CAFE and the Department of Earth and Environmental Science in the College of Arts and Sciences.

Current areas of concern and major recommendations

There are four primary areas of concern regarding the potential to maintain, and continue to build, the NRES program that emerged from the self-study process reported on in this document.

(1) Concern that growth of student enrollment in the program, combined with limited ability to recruit new faculty, leaves the curriculum vulnerable to instructor shortfalls. There are two ways this could occur. First, with our enrollment numbers increasing there are several courses with a field component that are at or near capacity because of limitations to the number of students that can be accommodated on instructional field exercises or in course where classroom size or access to classroom computers limits enrolment. In one case, a second field-based section has been added to accommodate high numbers, but even so the course is at capacity. Second, with declining faculty numbers in the CAFE as a whole, there is increasing potential for push-back from department chairs trying to limit the contributions of their faculty to this interdisciplinary program, especially in cases where the hiring of those faculty members was not explicitly tied to an expectation for NRES involvement, or where institutional memory of hiring with ties to NRES are faltering.

- Recommendation for improved articulation, documentation, and maintenance of commitments from faculty and departments where hiring was partially predicated on contributions to NRES.
- Recommendation for more intentional hiring of future CAFE faculty positions to include NRES responsibilities where clear connections exist between the research and teaching focus of the faculty position and this multi-disciplinary program.

(2) Concern that program lacks needed administration and academic space of sufficient size and quality. Although the NRES students spend quite a bit of time in the Forestry building, the lack of a dedicated space is a recurring theme. For example, the NRES program is limited by very poor administrative space for the NRES Academic Coordinator, who is the primary program recruiter. The program also lacks any dedicated space for storage of equipment used in academic and administrative functions. The capstone course is intended to develop professionalism in our students, but the program lacks a space and the materials to work together in their teams throughout the semester. Finally, with NRES-affiliated faculty spread across five departments, there is little opportunity for faculty to interact except by design, such as during NRES Steering Committee meetings.
- Recommendation for renewed discussions with CAFE administrators about opportunities to create space for NRES program. Ideally, such space would include office space for the NRES coordinator that is large enough to comfortably accommodate at least two visitors, storage space for NRES equipment, and a shared administrative and academic meeting space.
- Recommend consideration of shared space, perhaps in the Dimock building, that could encourage synergies across several units within CAFE or across the University that share academic interests and limitations, such as the Tracy Farmer Institute for Sustainability and the Environment.

(3) Concern that the new funding model could limit funding to the NRES program beyond the CAFE commitment for recurring funds of $15K and support of the Academic Coordinator. Currently, CAFE funding mostly covers program expenses, but not entirely. Program expenses that fall outside the amount of the recurring funds are covered with tuition returns to the program from the summer camp section that is taught in state. Current and potential uses of additional funds include covering the costs of field-based courses resulting from insufficient course fees, funding faculty expenses for a Costa Rica field course to offset costs to all students, need-based scholarship support for students to attend the Costa Rica or Robinson Forest summer camp in addition to scholarships provided by Education Abroad, and funding to support students attending conferences.
- Recommendation to initiate the development of an educational endowment for the NRES program to support students. With more than twenty years of graduates now working as natural resource and environmental professionals, we are at a point where we could start to fund-raise. We would like to engage with the CAFE Office for Advancement in exploring a program for developing funding to support the NRES program.

(4) Concern regarding impacts of the new budget model on this and all interdisciplinary programs. Despite frequent reassurances from multiple quarters that the new budget model should not negatively affect interdisciplinary programs, it is not clear that this message has filtered down to all departments. The perception probably stems in part because faculty time is stretched increasingly thin across the University. Since the NRES program solicits faculty to teach, advise, and serve on the NRES Steering Committee through engaging and leading by example, and since many of these faculty have no explicit commitment through the hiring

process for them to contribute to the NRES program, the primary concern revolves around the program being able to maintain (and potentially expand) the future undergraduate instructional and advising program mission.

- Recommendation that department chairs and leaders of interdisciplinary programs engage in a College-wide round-table discussion about how implementation of the new University-wide budget model will/will not impact these programs.
- Recommendation that the CAFE consider implementing explicit incentives to participating departments to maintain and increase faculty support for this and other interdisciplinary programs.
- Recommendation that consideration be given to hiring of tenure-track lecturers, or other types of teaching faculty, to teach courses that would support NRES as well as other programs. This is another place where synergies among similar programs could be nurtured.

II. Unit Self-Study Report Checklist

	Academic Department (Educational) Unit Overview:	Page # or NA
1	Provide the Department Mission, Vision, and Goals	1
2	Describe centrality to the institution's mission and consistency with state's goals: A program should adhere to the role and scope of the institution as set forth in its mission statement and as complemented by the institutions' strategic plan. There should be a clear connection between the program and the institutions, college's and department's missions and the state's goals where applicable.	1
3	Describe any consortial relations: The SACS accreditation process mandates that we "ensure the quality of educational programs/courses offered through consortial relationships or contractual agreements and that the institution evaluates the relationship and/or agreement against the purpose of the institution." List any consortium or contractual relationships your department has with other institutions as well as the mechanism for evaluating the effectiveness of these relationships.	NA
4	Articulate primary departmental/unit strategic initiatives for the past three years and the department's progress towards achieving the university and college/school initiatives (be sure to reference Unit Strategic Plan, Annual Progress Report, and most recent Implementation Plan)	1
5	Department or unit benchmarking activities: Summary of benchmarking activities including institutions benchmarked against and comparison results: • number of faculty, number of students, etc.	NA
	Faculty and Graduate Students:	
6	Number of faculty and FTE breakdown by DOE, faculty list, brief bios or CVs	2-3 App. B
7	Overview of current research program and plans. Describe primary faculty contributions to the three-four strongest research and creative areas in the dept.	NA
8	Describe primary faculty contribution to teaching and service at the department level that have enhanced college and university strategic initiatives.	NA
9	Describe attrition (cumulative number not tenured, resigned, retired, or other) of the program faculty over the past three years. Discuss the expected effect on program under review and other issues related to ability to retain qualified faculty during the past three years.	3-4 App. F
10	List current number of unfilled lines and discuss current actions or plans to fill line. Include general description of "start-up" packages.	NA
11	Number of graduate students and departmental-level TAs and RAs. List the salary range for TAs and RAs and estimate the number on fellowship for the current or most recent fall semester.	NA
12	Describe the reasons students reject fellowships or assistantship offered from the university, college, or department/unit**.**	NA
13	Number of postdocs	NA
14	List of grants and contracts for the period of review, including funding amounts	NA
15	Faculty fellowships	NA

16	Faculty honors & recognition	App. B
17	Publication list for period of review, including graduate & undergraduate publications	NA
18	Undergraduate research activities & initiatives (if applicable)	4-5
	Documentation of Implementation of Policies & Procedures: Identify the educational policies and procedures established through faculty governance and responsible parties for implementation. Explain dissemination and transparency.	
19	Evidence of adherence to educational policies and procedures established through the faculty governance process, including consistency in applying policies related to grading, probation, admissions, termination	5
20	Evidence of consistent review and monitoring of course substitution, course equivalency credits, course substitutions, course transfers toward degree completion, and vetting of exceptions, degree requirements	5
21	Evidence of adherence to unit procedures on faculty personnel actions (e.g., appointment, promotion and tenure) and budget request preparation	NA
22	Evidence of course scheduling and teaching assignment	6
	Academic (Degree) Program Description:	
23	Program demand/unnecessary duplication: • Number of UG and G students enrolled and credit hour production • Number of UG and G degrees conferred • Explanation of how curriculum is different from existing programs at other state institutions or that access to these programs is limited • Explanation of pursuit of collaborative opportunities with similar programs at other institutions and how collaboration will increase effectiveness and efficiency	6, 9, 17
24	Program history and background/organizational structure: Critical events/background information which will help in understanding the program currently.	6-7, 14
25	Program uniqueness: Unique components, distinctive innovations. Is the program a response to changes in the discipline or other academic necessities?	7-9
26	Describe how the program is administered (e.g., is there a program coordinator and/or program committee? What is his or her role or function? How do the administrators of the program operate?)	2-3
27	Describe the recruitment and development plan for the program (include attention to faculty, staff, and students).	14-16
28	Program delivery: Review of distance learning course offerings, services and outcomes to ensure compliance with best practices, SACS policies, and federal rules, University Senate and college curriculum committees. Describe flexibility of program delivery. Are classes available at convenient times and in convenient formats for non-traditional students, etc.	5, 13-15, 18
29	Program contributions to undergraduate general education or UK General Education Core	NA
	Program Quality and Student Success: The curriculum should be structured to meet the stated objectives and student learning outcomes of the program.	

30	Student Learning Outcomes Assessment • Evidence of attainment of student learning outcomes for all program delivery, as applicable (e.g., traditional, online, distance education, etc.) • Program assessment of Student Learning Outcomes for graduate programs and undergraduate programs • Assessment results reports and findings for improvement (include evidence) • Evaluation of students' post-graduate success	15-16
31	External awards or other recognition of the students and/or program	16
32	Six-year graduation rate	17
33	Employer satisfaction with graduates as measured by surveys and/or alumni satisfaction	17
34	Job placement for undergraduate and graduate students or graduate school admission	17-18 App. L
35	Pass rates on licensure/certification	NA
36	Describe processes used to ensure currency of curriculum (industry advisory boards, pass rates on licensure, standardized tests, etc.)	2, 6
37	Describe quality of orientation, advising, other student services/developmental programs, effectiveness of advising, innovations in advising and efforts to improve	19
38	Instruction: Overview of current instructional program(s) and plans; describe measures of teaching effectiveness and efforts to improve (e.g., faculty development initiatives for instruction, teacher mentor programs) • Class sizes and faculty nucleus for program instruction • Instructional equipment • Faculty credentialing to support core/elective course offering • Internship/independent studies/ co-curricular	19-22
39	Program qualifications/standards for incoming students, program admission	NA
	Program Resources:	
40	Cost and funding of program. Please show detail. • Student credit hour per instructional faculty FTE • Budget summary information and adequacy. Include external funding.	20-22 App. D
41	Facilities (description and adequacy)	22
42	Equipment (including IT capacity) description and adequacy	22-23
43	Personnel summary and adequacy (faculty and staff numbers, demographics)	3
45	Support from other university units such as college, research, administration, human resources, development and alumni affairs	4, 14, 20-21
	Input from Affected Constituents:	
46	Evaluation data from staff, faculty, students, (e.g., surveys, focus groups, interviews, etc.) Information gathered from accreditation visit/external reviewers and progress updates since last program review (append external review comments for accredited reviews).	23
	Operations:	
47	Quality of faculty & staff communications and interactions, such as awards/recognitions, opportunities for input, unit meeting schedule, unit retreat schedule, opportunities for faculty and staff to interact, organizational chart	23-24

	Service, Extension and Non-Extension Programs:	
48	Summary of quantity and quality of outreach and community service; interrelationship of public service with research and other aspects of the program; nature and quality of service to the university and discipline	NA
49	Summary of extension programs by topic	NA
50	Summary of county-level programs	NA
51	Summary of youth programs	NA
52	Summary of community-based programs and training	NA
53	Extension publications, videos, etc.	NA
54	Evidence of public service activities such as congressional testimony, service on boards	NA
55	Number of FTE extension faculty and extension specialists	NA
56	Description and evaluation of outreach, service, and engagement activities	NA
57	Number of clientele served, programs, and training opportunities	NA
	Other Areas:	
58	Quality Enhancement Plan (Multimodal Communications Across the Discipline): Please indicate program contribution to the goals of the QEP. See http://www.uky.edu/presentationu/	24
59	University Diversity Plan: Please indicate ways in which the program contributes to the University's Diversity Plan. See http://www.uky.edu/DiversityPlan/diversity_plan.html	24

III. NRES Self-Study Report

A. NRES Program Overview

Mission, vision and goals

The mission of the NRES program is to educate undergraduate students about interdependent natural resource and environmental science issues in a contemporary global context. This is accomplished by tethering elements of natural and social science courses, coupled with the humanities, in an integrated fashion to equip graduates with creative problem-solving skills.

The vision of the NRES program is to be recognized for its development of natural resources and environmental professionals who contribute to science-based solutions in Kentucky and beyond. Graduates will work in public, private and non-profit sectors in fields such as environmental law, environmental consulting, regulatory enforcement, environmental education, reforestation and restoration, natural lands management and stewardship, wildlife management, conservation biology, environmental sustainability, economics and policy, and geospatial applications.

The NRES program has three primary goals.

1. To prepare students for leadership roles in addressing ever-changing and increasingly global natural resource and environmental concerns.
2. To promote a learning environment that values diversity of thought and culture, developed through educational opportunities that include hands-on field and laboratory experiences, require development of written, oral, quantitative, and visual communication skills, as well as problem-based experiential and service-learning in individual and team projects and study abroad.
3. To prepare students to be lifelong learners who contribute to the improvement of the environment and quality of life and environmental sustainability by making connections across disciplines that integrate social, cultural, economic and environmental perspectives.

Relationship of NRES program to UK and CAFE missions and goals

The mission, vision and goals of the NRES program are closely related to the education components of the CAFE and University missions, visions and goals. The primary contribution of this interdisciplinary undergraduate program is to educate students who are able to apply basic knowledge in the natural and social sciences to solving natural resource and environmental problems in an ever-changing and increasingly globally-connected world.

Strategic initiatives and progress on implementation plan from the last review

The previous self-study and periodic review, and the subsequent response and implementation plan, identified three key areas which have been addressed as follows:

Resources: At the time of the last review, the NRES program did not have any dedicated staff or funds, but relied entirely on resources from the supporting departments. The NRES program now has an Academic Coordinator, Ms. Geri Philpott, who was hired in June 2011. In addition, the program has a commitment for recurring operating expenses of $15K per year. It was recommended that the program have dedicated space, perhaps shared with the Sustainable Agriculture undergraduate program, in a neutral location (not affiliated with any departments) within the College, but this was not accomplished.

Instructional, advising, and recruitment concerns: At the time of the last self-study, the program was called Natural Resources Conservation and Management, and reviewers identified a need to refocus the program to better train students in environmental science and policy, to improve guidelines for advisors, and develop a more intentional recruitment plan. In 2009 we revised the curriculum significantly by creating much more focused and rigorous areas of concentration.

Students now take 18 hours of 'concentration' courses divided between an Analytical Skill Development area (ASD) and an Environmental Systems Emphasis Area (ESEA), with the goal that students will develop both analytical skills and a deeper understanding of a specific environmental system (see curriculum in Appendix A). At the same time, we changed the name to Natural Resources and Environmental Science (NRES) to better reflect the focus on environmental science. In 2012, we further revised the curriculum to add one additional ASD and two additional ESEAs in response to newly identified needs; this revision was approved November 2013.

We have increased access to advising information for students and faculty through an improved website presence. Our website (http://nres.ca.uky.edu/) not only has increased accessibility of all advising information, but also serves to engage students regarding opportunities for internships, education abroad, additional (non-academic) training opportunities, and post-graduate job search. With the hiring of the Academic Coordinator we have significantly expanded our recruitment efforts both on and off campus, and our increasing student numbers reflect those efforts.

Work more closely with faculty and department chairs: The underpinning of this recommendation from the last review was a concern that there was not a sufficiently clear commitment from department chairs and College administration to continue to provide faculty resources to maintain and strengthen the NRES program. Since the last review, several faculty members were hired with either explicit or implicit expectations to provide instructional support to the NRES program. Even so, this continues to be an ongoing concern, along with the concern that a small number of key faculty members keep the program administratively and instructionally afloat. The NRES Steering Committee members have worked to keep chairs of affiliated departments informed about the program, have engaged a new department (Biosystems and Agricultural Engineering) through one of its faculty members who is now an advisor and Steering Committee member, and have added program options that engage faculty in the Sustainable Agriculture program within the College of Agriculture, Food and the Environment, and faculty in the Department of Earth and Environmental Science in the College of Arts and Sciences.

B. NRES faculty

The NRES B.S. program is an interdisciplinary program within the College of Agriculture, Food and Environment. As such, all faculty members who contribute to the NRES program do so from their primary positions in an academic department. In some cases, faculty were hired with explicit expectations for teaching and other contributions to the program; in most cases, faculty contribute to the program out of a personal commitment to the goals of the program, and with the consent and support of their department chairs. Faculty affiliated with the program fall into several categories which reflect their level of involvement (Table 1; Appendix B). The NRES Steering Committee (SC) is a group of faculty whose responsibility it is to develop and deliver the curriculum (see description of organizational structure on page 14). Most members of the NRES SC advise students, along with several other faculty members who also advise students. Two additional faculty members contribute to NRES 'core' courses but don't serve as academic advisors. The Academic Coordinator teaches a core course, meets with students upon first arrival in the program, especially students transferring from other programs or universities; once in the program these students are assigned a faculty advisor.

Faculty who contribute to the NRES program through teaching, advising and service on the NRES SC do so largely out of strong professional connections to the mission, vision and goals for the program. The NRES SC members work together in a strongly collaborative manner, and are excited to be a part of the NRES program. In a survey of faculty conducted for this self-study, six out of 14 faculty members stated that they would be interested in increasing their involvement with the program; the other 8 faculty members stated that they would like to maintain their current involvement (Appendix C). In addition, three respondents (not including the current NRES SC Chair) stated that they would be interested in taking on a leadership role in the future, and five said

that they would consider it. This strong commitment of the NRES faculty to the program is one of its key strengths.

Faculty contributions to the NRES program have been significantly affected in the last three years by the retirement of the previous NRES SC Chair, and the promotion of the Director of Undergraduate Studies (DUS) to the position of Associate Dean of Instruction in the CAFE. The former DUS taught NRE 301 and NRE 471 (the capstone course), leaving significant leadership and teaching gaps. In response to those gaps, the current NRES SC Chair picked up teaching responsibility for the capstone course, the Academic Coordinator picked up teaching NRE 301, and a new NRES faculty member joined the NRES SC as the DUS. None of the current NRES SC members are nearing retirement. One faculty member who is on the NRES SC, advises, and teaches a core course was recently awarded tenure and promotion. Of the nine members of the NRES SC, three are untenured faculty. Assuming that these three faculty members are awarded tenure and promotion, there should be some stability in the NRES SC for the foreseeable future, particularly in light of survey responses stating that all involved faculty would like to maintain or increase their involvement in the program.

Table 1: Twelve faculty and one staff member from five different CAFE departments, plus the NRES Academic Coordinator, contribute to the NRES program as NRES SC members, advisors, and instructors.

NRES SC members	**Roles**	**Home department**
Mary Arthur	NRES SC Chair, advisor, teaches two core courses	Forestry
Chris Matocha	NRES Director of Undergraduate Studies, advisor, teaches core course, contributes to NRES Summer Camp	Plant and Soil Science
Carmen Agouridis	Advisor, teaches an NRES elective, contributes to NRES Summer Camp	Biosystems and Agricultural Engineering
Chris Barton	Advisor, teaches an NRES core course, significant contribution to NRES Summer Camp	Forestry
Brian Lee	Advisor, teaches core course, contributes to NRES Summer Camp	Landscape Architecture
Dave McNear	Advisor, teaches core course, club advisor	Plant and Soil Science
Rob Paratley	Teaches core course plus two electives; teaches Costa Rica summer camp	Forestry
Jack Schieffer	Advisor, oversees internship program and internship forum, teaches 2 core courses	Agricultural Economics
Andrew Stainback	Advisor, teaches two core courses	Forestry
NRES advisors		
Mark Coyne	Advisor, former NRES SC member	Plant and Soil Science
Elisa D'Angelo	Advisor, former NRES SC member	Plant and Soil Science
Mike Lacki	Advisor, former NRES SC member	Forestry
NRES core instructors		
John Cox	Teaches core course	Forestry
Geri Philpott	Teaches core course, advises students on first entry to the program, oversees NRES Summer Camp at the Robinson Forest	Academic Programs
Steve Price	Taught Costa Rica summer camp in 2013, teaches elective course	Forestry

The challenge for recruiting new faculty members to the NRES program lies in the tension between commitments to their home departments and interest in contributing to the NRES program. Most of the department chairs of the affiliated departments perceive that the benefits for faculty of contributing to NRES outweigh the costs to the home department of either real or perceived reductions in research productivity or departmental teaching contributions. Nonetheless, recruiting new faculty is increasingly challenging as the number of faculty in the CAFE has declined significantly over the past five years. Thus, even when department chairs see the value in supporting the NRES program through faculty commitments, there are fewer faculty members available to make these contributions.

There are no graduate teaching assistants or research assistants tied to the NRES program. However, we do fund 1-2 undergraduate instructional assistants (UIA) to support teaching of NRES courses. We have supported the fall offering of NRE 355 in this way for the past 3 years because this course is taught by a part-time instructor in the evening; by offering a second evening 'help session' staffed by the UIA, we are able to better support student learning. This year we also supported a UIA for NRE 301, to help with the logistics of a 2-day field trip to Mammoth Cave National Park for an increased class size of 36 and to provide instructional support.

As an undergraduate program, opportunities to attract funding come about largely through internally-competitive sources on campus. We have obtained funding from internal sources to support undergraduates in various ways, as follows:

- 2010: Teaching Innovation and Incentive Fund from College of Agriculture - $8800 award to support tuition costs for NRES students to attend NRES Summer Camp, in the first year that the full cost of tuition was charged to the students.
- 2012: Ag and HES Alumni Association - $1223 to support four students to attend the 2012 Kentucky Association for Environmental Education Conference
- 2012: Over $3000 in funding received for NRES Senior to attend the United Nations Eleventh Conference of the Parties Convention on Biological Diversity in India from three sources: Anonymous Alumni donation, UK Student Conservation Association, and CAFE student travel grant
- 2013: Charles E. Barnhart Fund for Academic Excellence Award - $1000 to support the combination of the NRES Internship Forum with the Ag Career Fair
- 2013: $4000 from the College of Agriculture to support the 2013 NRE 320 Costa Rica course
- 2013: Program Development Grant from UK Education Abroad - $2000 to support two faculty members to travel to Costa Rica for development of NRE 320 Costa Rica

Undergraduates in the NRES program have opportunities to conduct research. The program requires that all students conduct either a 3-credit internship (NRE 399) or a 3-credit research experience (NRE 395), the latter of which is typically, though not always, conducted in the research group of a faculty member in NRES. On average, about 20% of NRES students conduct research. In the past 5 years, we have had a growing handful of students who have participated in NSF REU programs, presented research at the National Conference on Undergraduate Research, and presented their research at Posters at the Capitol in Frankfort, KY. And though not strictly research, two current students and an NRES graduate (now MS student) were selected to receive $1,500 for their proposal to The Tracy Farmer Institute for Sustainability and the Environment for their project to reduce on-campus electrical energy consumption by promoting the replacement of incandescent bulbs with compact fluorescent bulbs.

C. Implementation of policies and procedures

Faculty members in the program adhere to the CAFE policies and procedures for curricular approval processes, advising, course equivalencies, and course substitutions. Curricular approvals for courses and programs are faculty-driven processes. Any changes to the NRES curriculum are initiated by the members of the NRES SC who are the faculty of record for the program. All

changes or revisions go from the NRES SC to the Undergraduate Curriculum Committee (UCC), except for courses taught at the 400G or 500 level which are vetted by both the UCC and the Graduate Curriculum Committee. Membership on the committees is drawn from Directors of Undergraduate Studies (DUSs) for the UCC, with service following a two-years-on, one-year-off rotation. The NRES DUS, therefore, serves on this committee following that rotation cycle.

Academic advising is conducted by NRES faculty, made up of the faculty on the NRES SC plus 2-3 additional faculty members who have some history with the NRES program and SC, but who are not currently serving on the SC. Prior to every advising session (fall, spring and summer) College- and University-wide information is disseminated through the Office of Academic Programs via faculty orientation programs. Program-specific information is collected by the NRES DUS for dissemination directly to NRES faculty advisors via email, typically following consultation with the Academic Coordinator and other members of the NRES SC. Recently we have begun to also circulate a modified version of those advising notes to students via email as a way to keep them as informed as possible regarding any changes in course offerings. The fall 2013 NRES Newsletter included advising notes as well. The NRES Academic Coordinator is also very well informed about the curriculum, helps to develop advising materials, and meets with students on an *ad hoc* basis and particularly when new students transfer into the program.

Course equivalencies are mostly administered automatically once they are pre-determined through decisions that have been carefully evaluated by content experts in the past. As a result, when a new student enters the University, most transfer credits are automatically assigned as specific courses at UK. In cases where a course does not equate to an existing course it is the student's responsibility to provide the course syllabus for evaluation to the college, where they will be compared to targeted courses for a fair determination of equivalency.

Course substitutions are handled in a similar manner when necessary. Circumstances under which such substitutions are permitted are limited and specific. For example, if a course is only taught once per year, and conflicts with another course a student needs to graduate, the student's request for a substitution would typically be granted. Such a request would need to follow procedure, which is that the student would fill out a course substitution form, providing a rationale for the substitution, and the form would be signed by the student and the student's advisor. Appropriate course substitutions include: course of a similar or greater depth, course of similar or higher rigor, and course more closely related to a student's specialty support interests. Reasons for rejection of a course substitution request include a course substitution form lacking a rationale, lacking an advisor's signature, or asking for a lower-level course to substitute for a higher level or more rigorous course.

Degree audits are conducted for all students in the College though the Office of Academic Programs by the Director of Academic Services, supported by the APEX software that keeps track of students' courses in alignment with their major.

NRES core courses, which can have either a NRE course prefix or the prefix of a department, are taught at regular intervals as shown in Appendix D.

D. Academic program description

Program demand

There are several aspects of the NRES program (Appendix A) that distinguish it from other programs on the UK campus. The program is built around a core of pre-major and major requirements in the natural and social sciences which provide students with a strong framework for engaging with natural resource and environmental issues from multiple disciplinary perspectives. Early on in the program, students attend a 3-credit summer camp where they gain hands-on experience in a range of disciplines. Many of our students report that this is an incredibly valuable

aspect of the program, and one which gives them the opportunity to hone their ideas about how they want to focus their concentrations. In 2013, we added a second offering of the NRES summer camp, a 15-day field camp in Costa Rica. Together these two offerings provide students with a choice in how they complete a 15-day field experience, while allowing many of our students to go abroad for the first time in their lives.

As the students mature into the major, they are guided by their advisor in the selection of courses that will make up their Analytical Skill Development area (ASD; 9 credits), and their Environmental Systems Emphasis Area (ESEA; 9 credits). The ASD options available to students are: Economic and Policy Analysis, Environmental Education (new in 2013), Field and Laboratory Analysis of Ecosystems, and Geospatial Analysis. The ESEA options are: Conservation Biology, Earth Systems Science (in collaboration with the Departments of Earth and Environmental Science in the College of Arts and Sciences), Forestry, Global Sustainable Food Systems, Human Dimensions and Natural Resource Planning, Soil Science, Water Resources, and Wildlife Management. In addition, students have the option of creating an individualized ASD or ESEA, or both. To develop an individualized ASD or ESEA, students must write a proposal justifying their course choices and demonstrating that they have selected a coherent set of courses, which they submit to the NRES SC for approval. We have found that only a small number of students (1-2 per year) have submitted such proposals; in each case they were well-reasoned and provided the student with needed flexibility in their choice of focus. Importantly, students have led our faculty to create new ASDs and ESEAs, through several different avenues, which is one way that we keep our finger on the pulse of student interests, responding to these interests by modifying the curriculum accordingly. This happens in several ways. When students identify and create an individualized ASD or ESEA, the areas they describe sometimes resonate for multiple students, and we have converted these to ESEAs, as in the case of the recently developed ESEA in Global Sustainable Food Systems. Students are also good at finding minors that fit well with the NRES program, and this led to the development of the new ESEA in Earth Systems Science. Finally, in talking to students we hear about areas that they feel are missing; recently such conversations led to the creation of the new ASD in Environmental Education. For distribution of students into the ASD and ESEA options, see Tables 2 and 3, respectively. Students typically choose their ASD and ESEA at the end of their sophomore year or beginning of their junior year.

Table 2: Student survey responses to the question: What is your Analytical Skill Development Area (ASD)?

Options	Response Percent	Response Count
Economic and Policy Analysis	18.9%	10
Field and Laboratory Analysis of Ecosystems	30.2%	16
Geospatial Analysis	13.2%	7
Individualized, please specify below.	5.7%	3
I haven't decided yet	30.2%	16
Not applicable, I am an NRCM major	1.9%	1
Individualized (please specify)		2
	answered question	53

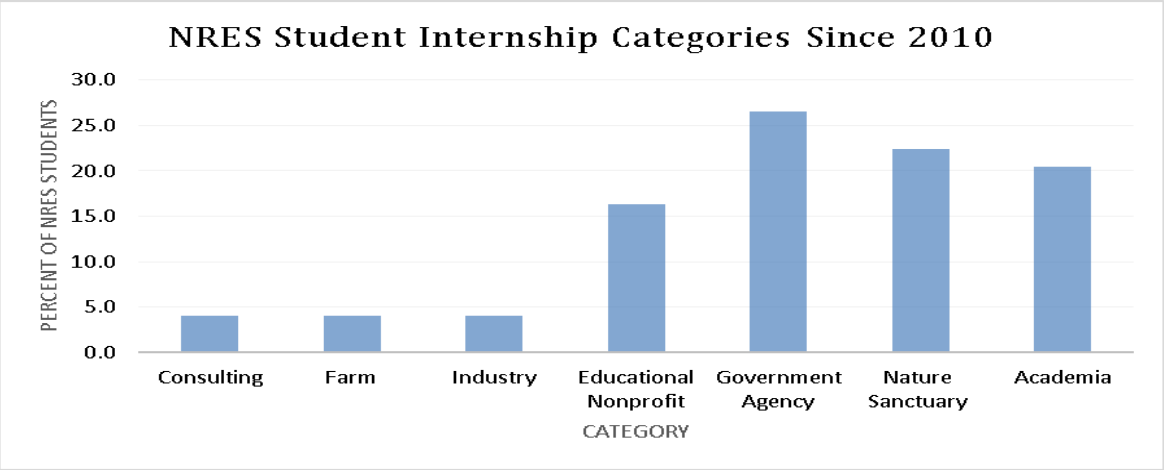
Table 3: Student survey responses to the question: What is your Environmental Systems Emphasis Area (ESEA)?		
Options	**Response Percent**	**Response Count**
Conservation Biology	13.2%	7
Forestry	3.8%	2
Human Dimensions and Natural Resource Planning	11.3%	6
Soil Science	1.9%	1
Water Resources	22.6%	12
Wildlife Management	18.9%	10
Individualized, please specify below.	9.4%	5
I haven't decided yet	17.0%	9
Not applicable, I am an NRCM major	1.9%	1
Individualized (please specify)		5
	answered question	**53**

The CAFE has a policy that requires that all undergraduate programs have an Academic Enrichment Experience as a part of the program, as noted:

> *"It is a goal of the College of Agriculture that each undergraduate who completes a degree in any of our programs will have had their own significant academic enrichment experience. Such experiences could include mentored research, supervised internships, service learning, guided studies abroad or other creative academic enrichment experiences. While each degree program is free to decide what sorts of options to make available to their students, the unifying characteristics of such experiences must meet the following criteria for each student: i) be an individually identifiable experience, ii) result in a measurable product, and iii) be managed through a specific course (or courses) within the program. Input and guidance on whether each program's option/options meet the College criteria will be provided by the Undergraduate Curriculum Committee."*

The NRES program has had an academic enrichment component since the beginning of the program (Appendix E). Students are required to conduct a 3-credit internship experience or research experience. Students conduct internships with a range of organizations (Figure 1). In addition, in the fall semester after the experience is completed, students must present their experience on a poster board at the Annual Fall NRES Internship Forum. Posters from these presentations for the past 5 years are posted on the NRES webpage (http://nres.ca.uky.edu/professional-opportunities/internship). The program also offers students the opportunity to obtain fire training and Wilderness First Responder training.

Figure 1: Categories of organizations in which NRES students have conducted internships since 2010



Several community-building activities have been incorporated into the program since 2008. There are relatively few courses with only, or primarily, NRES students in them, one of which is NRE 301. As such, this course, Natural Resources and Environmental Science (which will be taught as NRE 201 starting in Fall 2014 with the goal of reaching students earlier in the program), serves several important roles in the curriculum. The course has a two-day field trip to Mammoth Cave National Park, to which several service-learning and team-building activities have recently been added, creating a bonding experience among the students. We have been making a concerted effort to place all transfer students into NRE 301 their first semester in the program to nurture their connection to the program via relationships with other NRES students and the Mammoth Cave field trip. The recent curricular change from NRE 301 to NRE 201 will further enable us to get students quickly into a course within the major. NRE 320, Natural Resource and Environmental Analysis (summer camp) has also served as an excellent bonding experience, both among students and between students and faculty. The NRE 320 section taught at Robinson Forest, in eastern KY, is delivered from a base camp where faculty and students live together for three weeks in cabins and is another course that typically has only NRES students. The very recent addition of the NRE 320 section taught in Costa Rica served the same purpose; twenty students and two faculty members traveled throughout the country to visit different ecosystems.

Finally, the curriculum requires that students complete the NRES capstone course. The structure of this course is that the students work together, in teams, on a single natural resources issue during the spring of their senior year. The final product of the capstone course is a single written document that is distributed to stakeholders who interacted with students during the course, along with an oral presentation conducted for an audience of faculty, students, and stakeholders. The capstone documents from 2010, 2011, and 2013 can be found at: http://nres.ca.uky.edu/current-students/capstone.

The NRES program currently has approximately 95 students currently enrolled, having grown by about 30 students since the last review as has the number of students who have graduated each year (Table 4).

Table 4: Graduation numbers and number of students enrolled over the past 7 years, with demographic data. Graduation numbers and total number of students have increased since the last review.

NRES Program		2007 - 2008	2008 - 2009	2009 - 2010	2010 - 2011	2011 - 2012	2012 - 2013	2013 - 2014
Degrees Conferred		14	14	14	12	22	21	---
Total Enrollment		**57**	**68**	**70**	**80**	**85**	**98**	**95**
Gender	Male	30	41	46	53	56	54	51
	Female	27	27	24	27	29	44	44
Robinson Scholars		1	0	0	0	1	1	1
Chellgren Fellows		0	1	0	0	0	0	1
1st Generation		2	2	5	10	9	11	9
Honors		1	1	1	1	1	2	4
Entering with AP credit		2	3	4	4	8	5	10
Dean's List		17	18	19	15	28	25	
Transfers		4	11	13	17	5	13	9
Non-Residents		12	12	14	14	16	23	23
Ethnic Diversity		0	0	1	1	3	7	9

Program uniqueness

The Commonwealth of Kentucky has eight public institutions of higher education: Eastern Kentucky University (EKU), Kentucky State University (KSU), Morehead State University, Murray State University, Northern Kentucky University (NKU), University of Kentucky (UK), University of Louisville (UL), and Western Kentucky University (WKU). Each institution's website was examined to determine if the institution had a major or program similar to the Natural Resources and Environmental Science (NRES) major at the University of Kentucky. If a similar major or program was found at another public institution in Kentucky, a curriculum comparison was conducted to assess major similarities and differences.

Eastern Kentucky University, Kentucky State University and Northern Kentucky University were the only institutions offering a program with similarities to the NRES program at the University of Kentucky (Table 5). Though these programs have similarities to the NRES program, most notably with pre-major requirements and out-of-class experiential requirements (2 of 3 require a practicum or internship), major differences exist with regard to curriculum depth and the breadth of areas in which students can focus as well as the amount of flexibility offered to students in choosing electives. The NRES program offers a larger number of areas from which to choose with five Analytical Skill Development areas (ASDs) and nine Environmental Systems Emphasis Areas (ESEAs) including the ability to create an Individualized ESEA. While EKU offers two options in the Environmental Studies program and NKU offers four areas of study as part of their Environmental Science program, KSU offers only one. Importantly, none of the above-mentioned programs require a field techniques course or "camp" and none require a senior-level capstone course as is done with the NRES program, two significant instructional experiences for NRES students.

One area in which the NRES program lags is with regard to the wildlife ecology and management emphasis area. Both Murray State and EKU offer undergraduate degrees (B.S.) in wildlife management, and as such, offer students a wider selection of courses. For example, both institutions offer courses in mammalogy, herpetology and ornithology while UK had only offered a course in ornithology until recently. With a new faculty hire in the Department of Forestry, Herpetology was offered for the first time this year (2013) as a special topics course; it is expected to be offered regularly going forward, perhaps in alternating years. Plans are also in the works to develop and offer a course in mammalogy by a faculty member in Forestry, and with the agreement of the Forestry Chair.

The University of Kentucky has identified 10 institutions as benchmark institutions: Michigan State University, The Ohio State University, University of Arizona, University of California – Davis, University of Florida, University of Iowa, University of Michigan – Twin Cities, University of Missouri – Columbia, University of North Carolina at Chapel Hill, and University of Wisconsin – Madison. Two of the institutions, Michigan State University and The Ohio State University, were chosen for examination of their websites to determine if the institution had a major or program similar to the Natural Resources and Environmental Science (NRES) major at the University of Kentucky. If a similar major or program was found, a curriculum comparison was conducted to assess major similarities and differences.

Both Michigan State University and The Ohio State University have programs with similarities to the NRES program at the University of Kentucky (Table 6). At Michigan State University, three programs were identified: Environmental Sciences and Management Major, Environmental Studies and Agriscience, and Fisheries and Wildlife. At The Ohio State University, five programs were identified: Environment, Economy, Development, and Sustainability; Environmental Policy and Decision Making; Environmental Science; Forestry, Fisheries, and Wildlife; and Natural Resources Management. Because these other institutions offer multiple majors as opposed to multiple specializations within the same major (e.g. ASDs and ESEAs as in the NRES program), more in-depth coverage of an area is offered mainly because the core requirements shift, thus allowing a

larger number of hours in the area of specialization. In the NRES program, all areas of specialization (e.g. ASDs and ESEAs chosen) require the same core courses. Thus, all students in the NRES program have the same general knowledge regardless of area of specialization, while this is not the case at the other institutions. Having multiple majors such as at Michigan State University and The Ohio State University requires a larger number of courses, and hence faculty, than are currently available at the University of Kentucky.

Table 5. Comparison of NRES program at the University of Kentucky to Similar Programs at Other In-state Institutions.
[1]ASD = Analytical Skill Development; ESEA = Environmental Systems Emphasis Area

Institution	Program	Main Similarities to NRES Program	Main Differences from NRES Program
Eastern Kentucky University	B.S. Environmental Studies (Land Resource or Natural History options)	Both options require courses in ecology, botany, and geology.	Both options require course in microbiology. Courses offered in mammalogy and herpetology. No capstone course requirement.
Kentucky State University	B.S. Agriculture, Food and Environment with Environmental Systems option	Elective courses required in ecology, geographic information systems, soil science, and environmental entomology or aquatic ecology. Practicum (two 2 credit hour courses) required.	Students can substitute elective courses so that it is possible that no courses in ecology, geographic information systems, or soil science are taken. No in depth focus area as with NRES ASD or ESEA.[1] No capstone course requirement.
Morehead State Univ.	No such program identified.	--	--
Murray State University	No such program. B.S. in Geoscience with a focus on geographic information systems or environmental B.S. in Wildlife and Conservation Biology	--	--
Northern Kentucky University	B.S. Environmental Science	Pre-major requirements are similar. Internship or directed research project (3 credit hours) required.	Physics (two courses with laboratories) required. Students complete minor in biology, chemistry, geology or geography as part of the environmental science major requirements. No capstone course requirement.
U. Louisville	No such program identified.	--	--
Western Kentucky University	No such program identified. Minor in Geography related to environmental studies, environmental science, or water resources	--	--

Table 6. Comparison of NRES program at the University of Kentucky to Similar Programs at Benchmark Institutions.

Institution	Program	Main Similarities to NRES Program	Main Differences from NRES Program
Michigan State University	B.S. Environmental Sciences and Management Major B.S. Environmental Studies and Agriscience B.S. Fisheries and Wildlife	Between the three B.S. programs, the ASDs Economic and Policy Analysis and Environmental Education and the ESEAs Conservation Biology, Human Dimensions and Natural Resource Planning, Water Resources, and Wildlife Management are offered though not all in one major. Similar number of credit hours required between ASD and ESEA combined and concentrations within majors. Experiential learning experience required in Environmental Studies and Agriscience (only).	Larger number of specialty areas though more ASDs and ESEAs (e.g. Geospatial Analysis, Earth Systems Science). No courses offered in entomology. Use of study abroad and teaching experience to satisfy experiential learning requirement in Environmental Studies and Agriscience. Path towards "career and technical endorsement in agricultural education" in Environmental Studies and Agriscience (with teaching experience option). No capstone course required.
Ohio State University	B.S. Environment, Economy, Development, and Sustainability B.S. Environmental Policy and Decision Making B.S. Environmental Science B.S. Forestry, Fisheries, and Wildlife B.S. Natural Resources Management	Between the five B.S. programs, the ASDs and ESEAs are offered though not all in one major. Capstone course required (Environment, Economy, Development, and Sustainability) Experiential learning required (Environment, Economy, Development, and Sustainability; Natural Resources Management)	Number of specializations within each major is larger. For example, specializations (B.S. Environmental Science) offered in areas of ecosystem restoration and environmental molecular science. Only one restoration focused course in NRES in Water Resources ESEA. Because several majors are offered, core requirements differ such that a student in Environment, Economy, Development, and Sustainability has different core requirements than a student in Environmental Science). The benefit is that a student can study a topic more in depth at the undergraduate level. The downside is a more narrow focus. For example, students in Environment, Economy, Development, and Sustainability only take one course in ecology (Ecological Engineering). More credit hours required in selected area of specialization (generally 27-54 credit hours)

Also of relevance is that the NRES program offers a greater number of areas of specialization through ASDs and ESEAs than Michigan State University, but fewer than The Ohio State University. The Ohio State University, for example, offers specializations in ecosystem restoration and molecular environmental science. With the University of Kentucky's research endeavors into ecosystem restoration, particularly in the Departments of Forestry and Biosystems and Agricultural Engineering, offering a specialization within the NRES program in ecosystem restoration is a possibility with the development of new courses such as mined land reclamation, wetland restoration, and a course focusing on urban ecosystem restoration and/or sustainable design. A course in mined land reclamation is being developed in the Department of Biosystems and Agricultural Engineering as a service course to Mining Engineering.

Another key aspect of the program is the requirement of experiential learning either through a capstone course, an internship, and/or a study abroad experience. Not all of the examined majors at Michigan State University or The Ohio State University required an experiential learning component. At Michigan State, only students enrolled in the Environmental Studies and Agriscience major were required to complete an experiential learning component. And unlike the NRES program, completion of a study abroad course or teaching experience could satisfy the experiential learning requirement. At The Ohio State University, only one major required a capstone course and only two required an experiential learning component. The universal requirement of a course specializing in field data collection and analysis (NRE 320) through a summer camp was unique to the NRES program.

With regard to environmental education, Michigan State University offers a path towards "career and technical endorsement in agricultural education" which is not presently offered in the NRES program. Recently, the NRES program added an ASD in Environmental Education, so exploring the development of such a path towards environmental education, particularly in light of the Kentucky Environmental Literacy Plan at the Pre-K to 12th grade levels, is worth exploring.

Program history, organizational structure, and administration

The NRES program began as the Natural Resources Conservation and Management interdisciplinary degree program in 1990. It was approved as a new degree program by the College of Agriculture in 1994 with approval by the Council on Higher Education in 1996. The curriculum was revised in 2004, and again in 2009, at which point the name was changed to Natural Resources and Environmental Science. For more details on the history of the program, see Appendix F.

Since 1994 the Steering Committee (SC) has been the primary decision-making body for the curriculum, and oversees all facets of the program, including curriculum changes, course changes, course substitutions, advising information, and experiential learning opportunities. This committee is led by the Chair of the SC whose role is to nurture the program at all levels of the College and University. The Chair has the specific responsibility of calling and leading SC meetings, supervising the Academic Coordinator and Student Assistant, coordinating all facets of the program, and communicating with chairs of the affiliated departments and upper-level College administration on all issues related to the program. Membership on this SC has been somewhat fluid over the years; only one member of the current committee, the current Chair of the SC, has served on it since the inception of the program in the early 1990s. Over the past 20 years, 4 people have served in this chair position, for 2, 4 and 10 years for each of the first three chairs, by our best recollection (Appendix F shows the history of faculty service on the NRES SC). The fourth and current NRES SC Chair has served for 4-1/2 years thus far. The Distribution of Effort (DOE) assigned for this role has varied over the years; the current Chair has 15% of her DOE assigned to the role of Chair, the highest assigned for any NRES Chair, and reflecting the increasing workload that the addition of the Academic Coordinator, newsletter, and greater on-campus advocacy requires. The program also has a Director of Undergraduate Studies (DUS) whose primary role is to oversee curricular issues and to advocate for the program. The program has had 5 people who

have served in the DUS role, all of whom have been in the department of Agronomy/Plant and Soil Science. The current DUS has 10% of his DOE assigned to the role. Advising roles of the DUS include the coordination of summer advising, putting together a "cheat sheet" with guidelines for advisors prior to Fall, Spring, and Summer advising periods, and being accessible and responsive to advising or curriculum questions on a daily basis. The DUS serves as an advocate for the program, and works with the SC Chair and Academic Coordinator in preparing curriculum revisions and preserving the academic integrity of the NRES program. The DUS also meets frequently with prospective students.

The program has always had a requirement that students conduct a 3-credit internship or research experience, and since the mid-1990s we have held an annual internship forum for students to present their work. A faculty member from the NRES SC, the Internship Coordinator, is responsible for overseeing the NRES internship program and internship forum.

We continue to add new ASD and ESEA concentration areas to meet the demands of students and to address new areas of interest. In the most recent curriculum revision (approved 11/13) we added the first ESEA that required collaboration across college boundaries. The Earth Systems Science ESEA was developed in collaboration with the Department of Earth and Environmental Science (EES), and Dr. David Moecher, Chair of EES, will be joining the NRES SC to represent EES.

Recruitment and development plan: faculty, staff and students

When the program first began as an individualized program administered through a single faculty member in the Department of Forestry, students navigated their way to the program strictly by word of mouth. Enrollment numbers were surprisingly high given that there was no effort at recruitment and that the program was not recognized by the Council on Post-Secondary Education. Once the program became formally established and several departments became involved through the formation of the Steering Committee and contribution of faculty and other resources, the program was able to develop into a fully established inter-disciplinary program. Periodically there were concerns voiced over how program costs would be shared among the departments, but by and large there was shared ownership of the program by all the faculty and department chairs involved.

Over time, and with the erosion of faculty in the College as a whole, there are increasing constraints on faculty teaching time, making it more difficult to fill teaching roles within the NRES program. There are also concerns that, with the new budget model coming on line over the next two years, that department chairs may guard faculty time more carefully, especially when faculty are teaching courses without the department prefix. This is despite reassurances from different administrative levels that interdisciplinary programs will be supported. Finally, with few faculty positions explicitly tied to the NRES program through position descriptions, there is the potential that attracting new faculty onto the NRES SC, and nurturing future leaders of the NRES SC as Chair and DUS, will become increasingly difficult. First, to highlight this point, the current Chair of the NRES SC was hired in 1993 with an explicit commitment to the NRES program, articulated as responsibility for teaching the NRES senior capstone course. This faculty member has served on the NRES SC for 20 years, and while she had a significant break from teaching the capstone course, she is now teaching it again. On the other hand, to refute this concern, the NRES SC has recently added several new members. Rob Paratley, a Forestry staff member, instructor, and Curator of the UK Herbarium, was added to the NRES SC this past fall following his leadership of the Costa Rica summer camp experience. Dr. Carmen Agouridis, an Assistant Professor in the Department of Biosystems and Agricultural Engineering, joined the NRES SC in 2012. Carmen has demonstrated a commitment to several on-campus environmental and sustainability initiatives, and may be a long-term contributor to the NRES program. Finally, Dr. Chris Matocha became a member of the NRES SC in 2011, immediately jumping into the role of DUS. For Chris, as well, the NRES program seems to be a good fit for his interests, and nicely complements the contribution he was already making to the program through his teaching of PLS 366, Introduction to Soils, a core

course. One additional concern regarding faculty retention is that, as the program numbers grow, our capacity for teaching enough sections of required courses becomes increasingly stretched. To teach more sections will require additional faculty commitments, but there is no sense of where those faculty members would come from. The program does not have a specific plan for recruitment of faculty; however, there are several (fairly diffuse) strategies that we use to attract new faculty. First, NRES faculty lead by example to engage faculty who may be interested in contributing to this successful and exciting interdisciplinary program. In addition, it is important to maintain open communication with the department chairs whose faculty may be interested in contributing to the NRES program. And finally, maintaining communication with the Dean of CAFE is necessary in order to maintain program visibility and attention on the need for faculty commitments and financial support to the NRES program.

At the time of the last review there was also the recognition that, for a program in which all faculty are serving from within separate home departments, that there was a need for a dedicated staff member who could support the program with recruiting, teaching and student contact, and increasing demands for program assessment. With the hiring of Geri Philpott we accomplished all of these tasks. Geri teaches NRE 301, one of our core courses, and also provides oversight and responsibility for NRE 320 001, the summer camp that is taught at the Robinson Forest, in eastern Kentucky. In teaching NRE 301 she filled a teaching role vacated by the previous NRES DUS when he became the Associate Dean of Instruction. In taking over the NRE summer camp, Geri has also relieved a commitment to the camp previously made by a Forestry faculty member and current NRES SC member, Chris Barton. With only one staff member, staff retention is a matter of retaining Geri. Toward this end, we recently hired a Part-time Instructor to teach Environmental Education, rather than overloading Geri with another class. The only other 'staff' we hire as a program are undergraduate instructional assistants (UIA) who contribute to course support for a single course in a single semester, and the NRES Student Assistant. This year we hired a UIA to support NRE 301, taught by Geri Philpott, to help accommodate a jump in enrollment from 26 to 36 students. We have had four Student Assistants since 2010, each of whom was in the position for approximately 2 semesters. The Program Assistant can fill many roles, but a key role is the writing and design of the NRES newsletter. One aspect of better supporting Geri in her position could be to hire a second Student Assistant to help with additional tasks that typically fall to Geri, but that could be accomplished by a mature undergraduate. However, probably the most important key to retaining Geri is to identify a more suitable office space (see Program Resources, below). Her current office space is not only unsuitable for recruiting students to the program because of its tiny size, but it is also substandard space in terms of temperature control, noise from the air-conditioner, and tobacco smoke from outside.

In the last periodic review the need for more intentional student recruitment was identified, and an NRES SC member took on the task of recruiting students to the major. The NRES program has a history of many students entering the program as transfer students, typically from within the College or University, or from the local community college Bluegrass Community and Technical College (BCTC). Thus, part of our student recruitment plan revolves around increasing the visibility of the program so that it is more likely that students enrolled at UK will discover NRES earlier in their undergraduate careers. Toward this end, in 2010 the program developed a newsletter in large part with the goal of expanding program visibility. To aid in this effort and with newly acquired recurring funding, we hired the first NRES Student Assistant. The NRES Student Assistant writes and designs the newsletter in collaboration with the NRES SC Chair and AC, and also attends NRES SC meetings to bring a student voice to the discussions. The newsletter, which is targeted to current students, alumni and other stakeholders, is published once each semester just before advising, and is disseminated widely via hard and electronic copy to current students, multiple locations on campus, to county extension offices, to stakeholders, and to alumni (see Appendix G).

With the hiring of an Academic Coordinator in June 2011, the ability to retain and recruit undergraduate students to the NRES program expanded. Prior to that point, with no dedicated staff

member, recruitment was conducted by faculty, but only somewhat sporadically over the years. The AC, together with the NRES SC, has developed a number of new initiatives directed at student recruitment and student retention. For example, the AC is developing regular social events for current students to help build a sense of community, and this fall created a freshman mentoring program. The AC also identified that there was no student club to which many NRES belonged; rather, NRES students involved in campus activities are spread across multiple organizations, but with concentrations of students in the Student Sustainability Council, Green Thumb, Energy Club, and Horticulture Club. The creation of the Environmental Science Club in 2011 has served as a focal organization for many NRES students, and may serve as a recruitment tool as well because it is open to all students on campus. Another improvement directed towards recruitment is the creation of a 'welcome packet' with information for new and interested students that highlights the curriculum, but also the rich history and resources that encompass the program. The NRES website has been improved, and now has an 'Incoming Student' page that welcomes students to the program and provides relevant information. Another recent addition to the advising materials available on the website is the Internship and Research Experience Guide which provides information to students about how to set up an internship or research experience for credit. Additional recruitment activities conducted by the AC include attendance at campus and state events such as Big Blue Goes Green, Ag Roundup, Kentucky Science Teachers Association, Kentucky Association for Environmental Education, and Education Abroad fairs for the campus and for CAFE. Geri Philpott has built strong relationships with staff in Education Abroad, among leaders of the Advising Network, the CAFE Alumni and Development Office, BCTC, and Undergraduate Studies, all of which have helped create greater program visibility, and have led directly to recruitment of new students. Her active involvement with the growing group of CAFE Academic Coordinators serves a similar purpose, in that knowledge of the programs each AC represents allows them to direct students to the program that may be the best fit.

Over the past year we have been working with BCTC, which offers Associates in Science and Associate in Applied Science degrees to develop a 2x2 program wherein students would do their first two years at BCTC and then transfer to the NRES program at UK**.** BCTC has an Environmental Science Technology program which offers courses designed to train students in the study of natural resources (air, soil, and water) and pollution. The NRES program has recently approved a suite of BCTC courses which have direct equivalency to pre-major and major requirements within the NRES curriculum (Appendix H). In addition, one BCTC course can be substituted per ASD and ESEA and there is the option that a student can develop an individualized track. This enhanced collaboration is timely given the increasing number of BCTC students who have expressed interest in the NRES program.

E. Program quality and student success

Student Learning Outcomes Assessment

The NRES curriculum is built around 5 Learning Outcomes, which serve as the focus for program assessment:

1. Students will apply principles of chemical, biological, and physical systems to address natural resource and environmental issues.
2. Students will apply human systems principles to address natural resource and environmental issues.
3. Students will demonstrate safe and proper use of data collection techniques and methods in field and laboratory setting and conduct related analyses.
4. Students will be able to effectively communicate natural resource and environmental issues in written, oral, and visual formats to professionals and community stakeholders.
5. Students will demonstrate the ability to draw conclusions and make recommendations based on an interdisciplinary understanding of natural and human systems while functioning effectively in the capacity of an individual, team member, and team leader.

The curriculum is aligned across all five learning outcomes (see Appendix I). Assessment instruments and results can be found in Appendix J. Overall, analysis of our assessment data show that we are on track for successfully teaching the learning objectives for the program. However, we would like to improve our assessment instruments to incorporate more direct assessment that also better targets the learning outcomes specifically. Toward that end, we have a sub-committee of the NRES SC that is poised to develop improved assessments in early 2014, once the self-study process has been completed.

External awards and recognitions of students

Each year we have students who excel in various ways. Of those students who excel in the program, many do it through their extensive service involvement on campus and beyond. For example, many of our students are involved with the campus-wide Student Sustainability Council, engaging with on-campus sustainability efforts. A recent student who truly stands out in this regard is Patrick Johnson ('12) who was awarded the 2013 University of Kentucky Algernon Sydney Sullivan Award for service. This is a University-level honor awarded to one senior male and one senior female each year. Another student received an honorable mention from the 2012 Udall Scholarship competition, a very prestigious national award for students committed to environmental work.

Post-graduate success, alumni satisfaction, job and graduate school placement

In the process of conducting the NRES self-study we discovered that we have a gap in our ability to contact our alumni. Prior to hiring the AC, we did not have any capability to work on alumni contacts. When Geri Philpott arrived, one of the first things she did was to send a hard copy of the newsletter to a list of alumni she obtained from the CAFE Office for Advancement. Alumni who received the newsletter were invited to fill out an online survey that they could access through the NRES website, and 35 alumni responded. We recently sent out a survey to all alumni via email through the Office for Advancement as part of the self-study process, and only 10 alumni responded, all of whom had graduated in the past two years. This highlights a huge gap in our ability to contact alumni via email, and this is something that we plan to have an NRES student assistant begin to work on immediately.

We combined the information from the two surveys (the earlier online survey through the website and the recent email survey) to illustrate what we know about which sectors of the field of natural resources and environmental science alumni are working in (Figure 2). In addition to the categories shown in Figure 2, alumni also noted environmental permitting (3), environmental remediation (3), accounting/budgeting (3), and air quality (2) as job areas that they identified with.

Figure 2: Areas in which NRES alumni are working, based on 35 responses to a survey conducted in 2012 and 10 responses from 2012 and 2013 graduates to a recent survey.

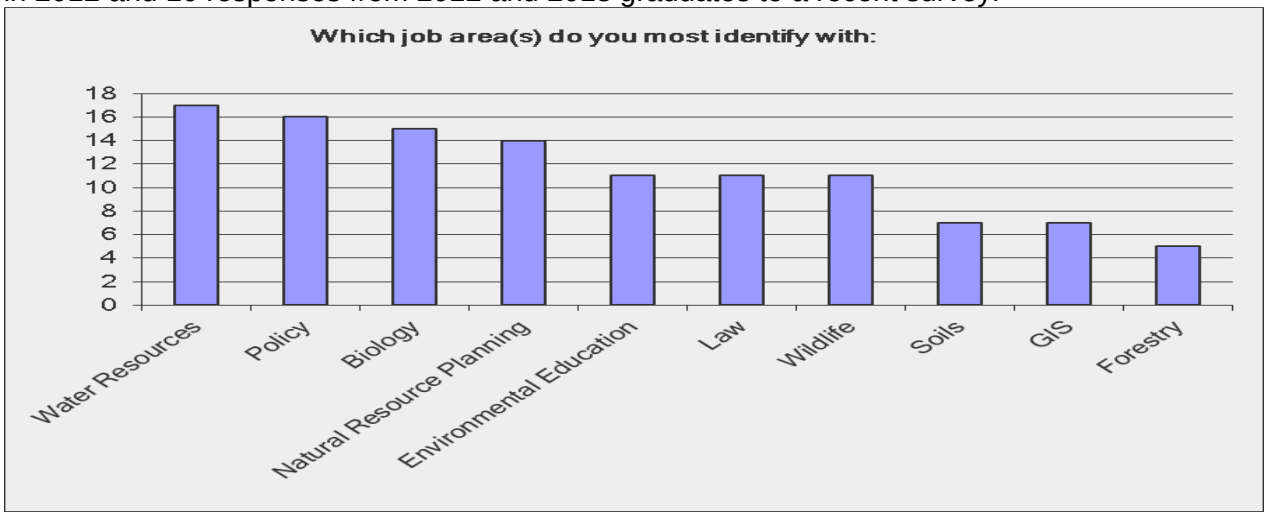
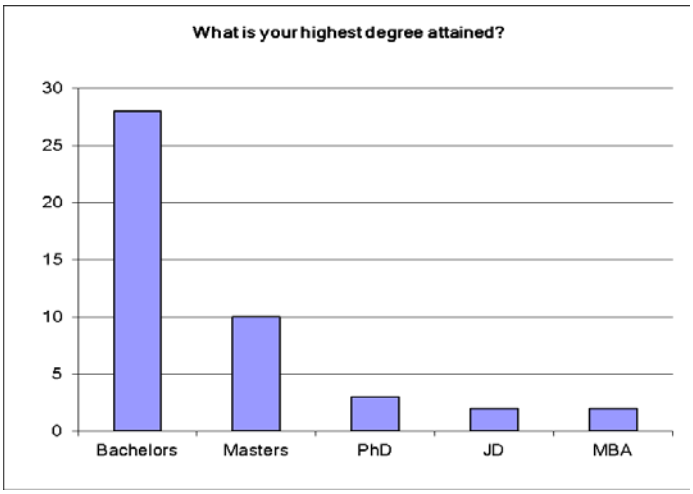


Figure 3: Highest degree attained by alumni respondents to two NRES alumni surveys.



We also have some information on degrees alumni have obtained beyond the B.S. (Figure 3). It is difficult to interpret the information we have because it is coming from a small proportion of our total NRCM/NRES graduates. However, it does confirm what we know anecdotally, which is that our students are gaining admission to graduate school, law school and business school.

Six-year graduation rate

Data on the graduation rate of NRES students is difficult to obtain because it has to be disaggregated from the combined data on the individualized curricula in the CAFE and therefore requires a special data request. We requested this information but have not received it.

In lieu of data on the six-year graduation rate, we have access to data compiled by the CAFE Associate Dean of Instruction, Dr. Larry Grabau. Data on the NRES program reveal several interesting trends that suggest the need for some additional attention from the NRES SC members. First, the data demonstrate that student high school GPA is more closely correlated with student GPA during the freshman year. However, there was no significant correlation between either high school GPA or ACT and retention. Perhaps the most dramatic, and potentially actionable, component of the analysis of retention was that out-of-state students in the NRES program came with significantly lower high school GPAs, earned significantly lower grades in their first year on campus compared to in-state students, and had lower retention in the major. Our recent focus on retention has been on students as they enter the NRES program; these data suggest that more concerted attention to support students that come to the program from out of state should be another focus area.

Quality of orientation, advising, and student services

Students throughout the CAFE are advised by faculty, and the NRES program is no exception to this. However, in addition to each student having a faculty advisor, NRES students also avail themselves of additional support from the NRES Academic Coordinator. Students meet with her early in their academic careers when they take NRE 201 (previously NRE 301); for transfer students, this is often the first course they take. Students are assigned to faculty advisors either as a result of a summer advising session with a particular faculty member when they first enter the university, or they are assigned by the Office of Academic Programs in a manner that is intended to spread the advising numbers out

Table 7: Number of advisees per NRES faculty advisor. Carmen Agouridis is an advisor but isn't listed because she doesn't currently have any advisees. Elisa D'Angelo will no longer advise after December 2013.

Advisor	Number of Advisees
Chris Matocha	28
Mary Arthur	17
Mark Coyne	14
Andrew Stainback	12
David McNear Jr.	7
John K Schieffer	7
Michael Lacki	5
Chris Barton	3
Brian D Lee	1
Elisa D'Angelo	1

among NRES advisors. However, students always have the option of changing advisors, and so the numbers are unevenly allocated among faculty as shown in Table 7.

In a fall 2013 survey of current students we asked them to rate the quality of the advising they feel they receive in the NRES program. On a scale of 1 to 5, where 1 is 'very dissatisfied' and 5 is 'very satisfied', mean ratings for the level of their satisfaction with their academic advisor ranged from 3.89 (for 'general quality of academic advising') to 4.15 ('amount of time in each advising session') (Appendix K). We also asked students to rate their academic advisor, and for these questions the mean ratings, on the same 1-5 scale, ranged from 3.92 to 4.3. We learned from this survey that students frequently augment academic advising with their faculty advisor with meetings with the Academic Coordinator, during which they commonly confer with her about internships, academic concerns, reference letters, and study abroad opportunities.

Teaching effectiveness

Teaching evaluations are one of the key measures used at UK to determine the effectiveness of teaching. Among other metrics, students rate the 'quality of the course' and the 'quality of the instructor', and the averages for each are compared to the averages across the College and the University. The average evaluation for the 'quality of the course' across all courses and all semesters (Table 8) is identical to the average for the University (3.4 vs. 3.38). Similarly, the average rating for the 'quality of the instructor' within the program is similar to that of the University (Table 9; 3.48 vs. 3.45). Several courses have received poor evaluations, and when this occurs instructional deficits are quickly addressed through a combination of instructor development and, rarely, changes in instructor.

There are various opportunities for faculty to be engaged in teaching-related professional development. For example, in the summer of 2012 four NRES faculty members and the AC participated in a week-long 'Sustainability Across the Curriculum' workshop taught at Transylvania University. Two faculty members have participated in a College-level Faculty Learning Community led by the Associate Dean of Instruction and focusing on student engagement. NRES SC meetings also address various teaching issues. For example, we share information about how different courses are going, with particular emphasis on the two summer camp opportunities. It is out of the NRES SC meetings that ideas for ways to improve the curriculum emerge, along with ideas for improving student access to information about potential internships, concerns about summer camp course offerings, student accessibility to courses, and a host of other program issues.

We have growing concerns about increasing class sizes, particularly with respect to certain courses. Class sizes for several courses are expanding to a tipping point. For example, in NRE 301, student numbers in the course make it increasingly difficult to conduct the seminal field trip to Mammoth Cave National Park. Park personnel restrict group size to 30 students, so as class size increases, this field trip becomes a problem. One option could be to limit enrollment in the course to NRES students, but the course serves not only as a good introduction to the program for majors, but also has the potential to recruit students to the program. In addition, even with limiting the course to NRES students only, the enrollment was already at 30 NRES students in 2013.

Concerns about enrollment in NRE 320, summer camp, have been greatly alleviated by offering two separate options for this course. However, offering the course in Costa Rica requires faculty who can commit to another 3-credit course, and that is presenting a challenge already after just one offering of this incredibly successful course. We have found that there are multiple faculty members who are keenly interested to contribute to the Costa Rica course; the challenge is coming from push-back from above, at the level of the home department.

There are a number of other courses, especially those that are required by both NRES and Forestry students (e.g., FOR 340, Forest Ecology; FOR 230, Conservation Biology; NRE 381, Natural Resource and Environmental Policy Analysis) for which enrollment is getting very high,

requiring multiple sections (taught by a single faculty member), or leading to limitations in classrooms that can accommodate the student numbers. In fact, the student demand for FOR 230 (Conservation Biology) exceeded the maximum capacity of the room determined by the fire marshall for fall 2013. Thus, Dr. John Cox (instructor for the course) had to deny override requests. According to Dr. Cox, enrollment has increased 5-10%/year over the last 5 years. The challenges for growing enrollment are particularly pronounced for courses containing lab sections or those with field trips such as FOR 340 and NRE 301. Identifying a larger classroom to teach in is one solution to growing enrollment. Inclusion of more sections of a particular course demands more faculty commitment, and as previously mentioned, it is unclear where additional NRES-affiliated faculty will come from. In order to meet current and future student enrollment projections, it is recommended that future CAFE faculty positions include an explicit connection to NRES. This will not only remove constraints to future growth but will also heighten visibility of NRES and promote synergies between and among traditional departments and disciplines.

Table 8: Average student evaluations of the 'quality of the course' for all of the courses taught as part of the NRES program 'core' since the last periodic review.

	Semester													
Course Name	**Fall 2008**	**Spring 2009**	**Fall 2009**	**Spring 2010**	**Fall 2010**	**Spring 2011**	**Summer 2011**	**Fall 2011**	**Spring 2012**	**Summer 2012**	**Fall 2012**	**Spring 2013**	**Summer 2013**	**5-Year Average**
University Average	3.3	3.3	3.3	3.4	3.4	3.4		3.4	3.4		3.4	3.5		**3.38**
NRE 301	3.8		3.4		3.6			2.8			2.6			3.24
NRE 381		3.8		3.6		3.5						3.55		3.61
NRE 355	2.5	3.1	2.4	3.3	2.4			3.1	3.2		1.9	2.8		2.74
NRE 320	3.7		3.9		3.9		3.9			2.2			3.9	3.58
NRE 471	2.5		3.8		3.5			2.9				3.8		3.30
PLS 366	3.6	3.6	3.4	3.4	3.6	3.6		3.4	3.5		3.5	3.7		3.53
FOR 230		3.1	2.6		2.6			3.4			3.1			2.96
FOR 240						3.4			3.5			3.5		3.47
FOR 325	3.8		3.6		3.9			3.6			3.5			3.68
FOR 340	3.5		3.4		3.5			3.4			3.3			3.42
FOR 460	3.5		3.5		3.4			3.6			3.8			3.56
AEC 445G		3.5		3.3	3.1	3.6		3.5	3.5		3.6	3.2		3.41
AEC 424		3.7		3.4	3.5	3.6		3.5	3.4		3.6	3.7		3.55
PHI 336			3.2	3.5		3.6		3.2	3.7		3.1	3.7		3.43
EES 385			3.4					3.5			3.3	3.7		3.48
Semester Average	3.36	3.47	3.33	3.42	3.36	3.55	3.90	3.33	3.47	2.20	3.21	3.52	3.90	**3.40**

There have been discussions among the NRES SC members about developing a new NRE course at the freshmen level. The purpose of this new course would be three-fold: it would serve as an entry point for NRES freshmen, build common ground early, and assist in recruiting efforts so that a greater number of students enter the program earlier in their undergraduate careers. If the new course was approved as a UK Core course, it would provide an additional option to satisfy the "Intellectual Inquiry in the Natural Sciences" area. However, we don't have a faculty member able to teach such a course at this time.

Table 9: Average student evaluations of the 'quality of the instructor' for all of the courses taught as part of the NRES program 'core' since the last periodic review.

	Semester													
Instructor	**Fall 2008**	**Spring 2009**	**Fall 2009**	**Spring 2010**	**Fall 2010**	**Spring 2011**	**Summer 2011**	**Fall 2011**	**Spring 2012**	**Summer 2012**	**Fall 2012**	**Spring 2013**	**Summer 2013**	**5-Year Average**
University Average	3.4	3.4	3.4	3.4	3.5	3.5		3.5	3.5		3.4	3.5		3.45
Arthur - FOR	3.5		3.4		3.6			2.95			3.2	3.8		3.41
Barton - FOR	3.6		3.75		3.6		3.9	3.7			3.8		3.8	3.74
Cox - FOR		2.9	2.5		2.5			3.4			3.2			2.90
Fryar - EES			3.7					3.5			3.2			3.47
Gorton - PTI AEC		3.9		3.6		3.8			3.4					3.68
Grabau - PSS	3.35	3.8	3.7		3.55									3.60
Infanger - AEC		3.65		3.65		3.65			3.7					3.66
Kalisz - FOR						3.4			3.7			3.9		3.67
Lee		3.2		3.3					3.2			2.8		3.13
Matocha				3.6		3.8			3.7			3.8		3.73
Maynard												3.4		3.40
McNear	3.8		3.7		3.9			3.5			3.7			3.72
Paratley	3.9		3.8		4			3.5			3.7		4	3.82
Philpott								2.7		1.4	2.6		3.6	2.58
Price													4	4.00
Sandmeyer			3					3.2	3.8		3.5	3.8		3.46
Sawyer												3.9		3.90
Schieffer					3.6			3.6			3.85			3.68
Stainback												3.7		3.70
Zourarakis	2.7		2.6		2.6			2.9			1.4			2.44
Semester Average	3.48	3.49	3.35	3.54	3.42	3.66	3.90	3.30	3.58	1.40	3.22	3.64	3.85	**3.48**

F. Program resources

Funding to support the NRES program comes primarily through support of faculty salaries, through the faculty home departments. Throughout the history of the NRES program, funding for new faculty positions hired within departments has periodically been tied to expectations for contributions of that faculty line to the NRES program, typically through teaching. For example, in the Department of Forestry Mary Arthur, Chris Barton and Andrew Stainback were hired with specific expectations for such contributions. In the Department of Agricultural Economics, Jack Schieffer was hired with a similar expectation. All four of these faculty members teach NRES core courses, serve on the SC, and advise students. Other faculty who contribute in these ways may have been hired with some (less explicit) expectations, or with no mention of the NRES program in their hiring; in any case, all NRES faculty contribute primarily out of a commitment to the program itself. In addition, faculty time for two NRES course offerings are currently taught by Part-time Instructors (PTIs), one section of NRE 355 (Introduction to GIS) and NRE 290 (Environmental Education) because of lack of faculty available to cover these. At a cost of approximately $4500 for a 3-credit course and finite funds for program support, this is probably sustainable at this level, but could not cover additional costs for PTIs should the need arise.

At the time of the last review, in 2008, the review committee identified the lack of a dedicated line of funding as a key constraint to the growth and development of the program, a problem which was resolved in 2009 following the last periodic review with the commitment of $15K in recurring funding to the NRES program from the CAFE. In 2011, in part as a response to the 2008 external review process, financial support of the Academic Coordinator position was added to the recurring funding allocated to the NRES program. This allocation of funding reflected the commitment of the College Dean to the NRES program, and recognition of the importance of this interdisciplinary program to the college. Though not one of the larger programs in the College, the NRES program does meet the needs of a significant minority of students looking to major in environmental sciences; the program has the second highest enrollment of the Environmental/Sustainability cluster of programs in the College.

The NRES annual budget for recurring expenses is $15K plus support of the Academic Coordinator position, which is spent following the approximate breakdown shown in Table 10. Starting in 2011 recurring funding for an Academic Coordinator was committed by the CAFE. The Academic Coordinator provides a wealth of support to the program in the form of instruction, *ad hoc* advising, development of education abroad opportunities, outcomes assessment, alumni communication, and a multitude of other activities directly aimed toward program enhancement and student success. Additional administrative support comes from various sources. Budget oversight is provided by Academic Programs. The office of the Academic Coordinator is in the Department of Forestry, leading to additional support from Forestry in the form of computer technical support and occasional minor support from the Forestry budget office. Copying and telephone are paid for by NRES program funds, including the copying costs for the course she teaches (NRE 301).

Table 10: Annual expenditures for recurring expenses that support the NRES program.

Item	Approximate annual cost
Printing by AC	$400
Phone for AC	$720
Conferences	$1500
Undergraduate Instructional assistants (NRE 355, NRE 301)	$1500
NRES events	$1500
Newsletter (2 printings/year	$1600
Part-time Instructors (NRE 355, NRE 290)	$9000
TOTAL	$16,220

Costs for course delivery (such as copying, computer support) that are taught with any prefix other than the NRE prefix are borne by the departments connected to those prefixes. However, most courses with laboratories or field trips have course fees to support the extra cost of running those courses, so this money, though paid for by those departments, is covered by student fees that pass-through the individual departments. Examples would be Forest Ecology (FOR 340) and Introduction to Soil Science (PLS 366), among others. For courses with an NRE prefix that carry course fees, these course fees come to an NRES account, and those funds are distributed directly to pay for the costs of running those courses. This applies to NRE 301, NRE 471, NRE 320 and NRE 420G. The total amount collected per student varies, but all funds are used for direct support of the course.

A third source of funds to the program is summer tuition funds that are returned to the program. This applies to NRE 320 when it is taught in Kentucky (we teach one section in Kentucky and one section in Costa Rica). For the course taught in Kentucky, because it occurs during a UK summer session, 40% of the tuition costs paid by the students are returned to the program. This has occurred only in 2012 and 2013, and since the amount is tied to the number of students in the course (22 in 2012, 8 in 2013), the amount has been highly variable and thus not a reliable source of funds. The anticipated amount of funding is approximately $440/student, based on an average mix of in-state and out-of-state students. Thus far, these funds have been used to cover shortfalls

from the annually recurring funds for general program costs (~$1,000) and shortfalls from course fees needed to deliver field component of NRE 320 and NRE 301 (trip to Mammoth Cave and Summer Camp shown in Table 11). It is unknown how summer tuition rebates will be handled under the new budget model, and this is a significant concern for the ongoing delivery of the NRES program.

Table 11: 2012-2013 Course costs above and beyond course fees

	Student Fee	Total Cost	# Students	Difference (cost-course fees)
NRE 301	$50	$2,650	36	$850
NRE 320	$500	$6,000	8	$2,000

Facilities that support the program are also shared among departments, though not evenly. The Forestry building has served as the default physical 'home' for NRES students on campus throughout the history of the program, and this has been facilitated by several factors. Probably first and foremost, there is some historical precedent for a strong association of the NRCM/NRES program with the Department of Forestry. The program was started by a Forestry faculty member in the early 1990s (Appendix F), and the Forestry Department has long provided both faculty and logistical support for the program. For example, the computer laboratory in the Forestry Department provides open access to NRES students along with Forestry students. This is very helpful for the NRES program and students because it facilitates their work for courses taught in the Forestry building, and because it provides a place to work where they are likely to find other NRES students. In addition, the opportunity for students in NRES and Forestry to closely interact with each other has always been valued by the Forestry faculty, and has been a goal from the perspective of the Forestry department for as long as the NRCM/NRES program has been in existence. In 2010, a shared Forestry-NRES undergraduate student lounge was created in the Forestry building which has further facilitated a sense among NRES students of having a physical space to be in on campus, although NRES student use of the lounge is somewhat limited. With the NRES AC housed within the Forestry building, this provides another reason for NRES students to come to the Forestry building, combined with the fact that quite a few NRES core courses are taught in the Forestry building (FOR 340, FOR 460G, NRE 301, NRE 381, NRE 471).

Despite the strong connections between Forestry and NRES, there is still a sense among faculty on the NRES SC and NRES students that there is a need for a physical space that is dedicated to the NRES program. In the past, this has been envisioned as office and meeting space, where the AC coordinator could readily accommodate more than one other person in her office, and where groups of students, faculty, and combinations thereof, could meet. In addition, there is a need for storage space for the program.

The small size of the AC's office allows for only one other individual to sit down for a meeting. Thus, if a prospective student comes with one parent then another room has to be found. There is also no mutual desk space where the AC can work with a student. Because of the office location the air conditioner must be used continuously in the summer, and when the air conditioner is on the AC cannot talk on the phone due to the noise. In addition, during the summer the AC's office door must remain closed (thus sometimes turning off students) to keep the cold air in. In the winter, the door must also be kept closed (to keep additional heat out) and the window all the way open (to let cool air in). Several prospective students, current students, administrators, faculty, and visiting professionals have remarked about the small size of the room and the uncomfortable temperature.

The NRES program owns very little equipment of its own. Instead, equipment has been supplied for field courses from the laboratories and teaching equipment supplies of individual faculty.

However, this is beginning to shift a little bit with the initiation of the Costa Rica camp, for which we purchased headlamps, a pair of binoculars, 2 portable weather stations, and several field pH meters. In addition, the NRES program has approximately 40 poster boards and several large sheets of foam core for the annual Internship Forum stored in the basement of the Forestry Building. The AC's office serves as storage space for internship posters, newsletters, exhibit materials (banners, handouts, displays).

G. Input from affected constituents

In preparation for the self-study, we conducted surveys of current students, alumni, NRES faculty, and the chairs of the NRES-affiliated departments.

We received completed surveys from 53 of 95 current students, a 56% response rate. Because we have the sense that many of our students transfer into the major rather than finding it as freshmen, we asked students whether they transferred into the program and found that 58% of respondents transferred either from another program at UK (55% of the transfer students), from BCTC (23%) or from another university (23%). Comments from the survey of current students illustrated a strong sense of satisfaction with the program (Appendix K).

We also conducted a survey of alumni; as noted above, this served largely to reveal to us that we have very poor email contact information for all but our most recent graduates. This is something that we will be working on immediately by contacting alumni at their most recent mailing address, held by the CAFE Office for Advancement, to request new contact information from them. We will likely do this together with a mailing that informs them of new initiatives in the program (such as the Costa Rica field course) and inclusion of a recent newsletter (see Appendix L).

A survey was sent to all NRES-affiliated faculty, including NRES SC members, NRES advisors, and faculty who teach an NRES core course. We have highlighted key information that emerged from that survey above. A synopsis of the survey data can be found in Appendix C.

The chairs of departments that contribute significantly to the NRES program all responded with insightful answers to the questions we posed in the survey. All chairs stated that there are direct benefits to their departments of involvement with the NRES program, which include faculty satisfaction, opportunities for faculty and departments to be involved in initiatives outside the departmental scope, and interaction and collaboration in the classroom among NRES majors and majors from the home departments. Indirect benefits were also cited, and included improved connectivity among faculty in the College and collaboration across departmental and disciplinary lines that can carry over to research and graduate education. Responses to the question asking chairs to characterize the costs to their departments of involvement with the NRES program were much more varied, in part reflecting different levels of departmental commitment to the program. However, four of the five chairs did not view the total cost as being prohibitive, and were neither concerned about how implementation of the new budget model would impact the strength of the NRES program in the future nor the contributions made by their departments. The chair who expressed the most concern about the costs of the NRES program to the home department provided a detailed analysis of the contributions made by the department. Complete responses from the chairs can be viewed in Appendix M.

H. Operations

The NRES Steering Committee meets on a semi-regular schedule, typically 3-6 times per year. Once per year the NRES SC includes the chairs of the affiliated programs in the meeting as a means to stay in communication with the chairs of the departments that are supporting the NRES program through faculty time and effort, space, and administrative support. In addition to face-to-face meetings 1-2 times per semester, the NRES SC conducts much of its work via email. In

addition, individual SC members take responsibility for specific tasks, and work directly with other faculty and/or the Academic Coordinator to accomplish those tasks. These tasks include such things as organizing the Annual Internship Forum, coordinating with the Bluegrass Community and Technical College on development of a 2x2 program, and development of summer camp experiences, both in Kentucky and in Costa Rica.

In addition, the NRES SC Chair, Director of Undergraduate Studies, and Academic Coordinator meet at least monthly, and more often when certain tasks (such as this self-study) require more frequent interaction. It is also the responsibility of the NRES SC Chair to engage with College administrators to advocate for the program and to maintain the visibility of the program within the College.

NRES faculty members work together to nominate students for awards and recognitions. When announcements come out about an award or recognition that is relevant to our students, the Chair, DUS, AC, or other faculty member will circulate the information and ask for people to consider who among their advisees or students they know from courses would be a good fit. In the past several years, NRES students have frequently been recognized as part of the CAFE Student Council recognitions for outstanding student awards.

l. Quality Enhancement Program and Diversity Plan

A goal of UK's Quality Enhancement Program (QEP) is to improve student's presentation skills through integration of oral, written, and visual communication skills. The NRES program contributes to this goal by requiring several courses which integrate communication across the curriculum, going beyond the general education level of Composition and Communication I and II. The NRE 301 (Natural Resources and Environmental Science) course is an introduction to natural resources. This course is approved to satisfy the graduation writing requirement (GWR). In light of the recent University-wide replacement of the GWR to the new graduation composition and communication requirement (GCCR), an evaluation of NRE 201 is necessary to ensure that it satisfies the GCCR requirements. An appraisal of the syllabus from NRE 301 (now NRE 201; see Appendix N) indicates that this course currently satisfies the revised requirements of the GCCR. Another course in which the NRES program contributes to the QEP is the requirement that students complete either a research experience or internship (NRE 395 or NRE 399). The students prepare a poster or give an oral presentation at the annual internship forum. Lastly, the capstone course (NRE 471, Senior Problem in Natural Resources and Environmental Science) is an opportunity to bring together knowledge and skills gained in previous courses to solve a problem related to natural resources and environmental science. The class focuses on a single issue in Kentucky by employing a suite of techniques including library research, data collection/analysis, and interviews to interrogate the problem. The students deliver oral presentations at the annual NRE 471 Capstone presentation and further develop written skills by contributing to the written report (see http://nres.ca.uky.edu/current-students/capstone).

NRES diversity has increased each year after 2011 to its current number of nine students who are considered ethnically diverse as shown in Table 4. Prior to 2011, the annual NRES ethnic diversity numbers were either zero or one. In 2011 NRES participated in the Freshman Summer Program (FSP) with the Center for Academic Resources and Enrichment Services (CARES) which is a division of the Office for Institutional Diversity. We hosted three students of diversity over several days engaging them in NRES activities and research. Before this time the CARES office had no knowledge of the NRES program or any environmental program on campus. As we reflect on this process we are making plans to increase our communication with the Office of Diversity by sending them our newsletters and other materials as created, maintaining stronger lines of communication aimed at keeping them aware of the NRES program.

External Review

Natural Resources and Environmental Science
Periodic Review
Final Report

Committee Team Members

The committee team consisted of:
Chair - Dr. Steve Workman, Assistant Dean for Research & Associate Director, Kentucky Agricultural Experiment Station
External - Susan Plueger, Director, Division of Environmental Policy, LFUCG
External - Dr. Robert Shannon, Dept. of Agricultural and Biological Engineering and Coordinator, Environmental Resource Management Program, Penn State
External - Dr. Michelle Wander, Dept. of Natural Resources and Environmental Sciences and Director of the Agroecology and Sustainable Agriculture Program, Univ. of Illinois
Internal - Karyn Loughrin, Natural Resources and Environmental Science, student
Internal - Dr. Jack Schieffer, UK Dept. of Agricultural Economics
Internal - Dr. Krista Jacobsen, UK Dept. of Horticulture
Internal - Dr. Lynn Phillips, UK Dept. of Geography

Committee Process

The review process included:

1. Committee members were invited to provide input as a team for an on-site visit.
2. Committee members reviewed the Natural Resources and Environmental Science Self Study for Periodic Review (2008-2013).
3. Committee met with Dean Nancy Cox to receive the charge concerning responsibilities of the review process.
4. Committee met with the NRES Steering Committee (SC), Department Chairs, Associate Deans of Instruction and Extension, faculty members, NRES Academic Coordinator, students, alumni, and stakeholders to collect data for committee discussion.
5. Committee discussed information received during working sessions to form the results of the preliminary review.
6. Committee gave a summary to the Dean concerning important issues affecting the success of NRES and a timeline for complete review was discussed.
7. Final draft of report will be sent to the Dean for review.

Program Overview

The Natural Resources and Environmental Science (NRES) B.S. program is an interdisciplinary program within the College of Agriculture, Food and Environment (CAFE). As such, all faculty members who contribute to the NRES program do so from

their primary positions in an academic department. Twelve faculty and one staff member from five different CAFE departments, plus the NRES Academic Coordinator, contribute to the NRES program as NRES Steering Committee (SC) members, advisors, and instructors. In some cases, faculty were hired with explicit expectations for teaching and other contributions to the program; in most cases, faculty contribute to the program out of a personal commitment to the goals of the program, and with the consent and support of their department chairs. The NRES SC is a group of faculty whose responsibility it is to develop and deliver the curriculum. Most members of the NRES SC advise students, along with several other faculty members who also advise students. The Academic Coordinator teaches a core course and meets with students upon first arrival in the program, especially students transferring from other programs or universities. Once in the program, these students are assigned a faculty advisor.

Mission, Vision, and Goals

The mission of the NRES program is to educate undergraduate students about interdependent natural resource and environmental science issues in a contemporary global context. This is accomplished by tethering elements of natural and social science courses, coupled with the humanities, in an integrated fashion to equip graduates with creative problem-solving skills.

The vision of the NRES program is to be recognized for its development of natural resources and environmental professionals who contribute to science-based solutions in Kentucky and beyond. Graduates will work in public, private, and non-profit sectors in fields such as environmental law, environmental consulting, regulatory enforcement, environmental education, reforestation and restoration, natural lands management and stewardship, wildlife management, conservation biology, environmental sustainability, economics and policy, and geospatial applications.

The NRES program has three primary goals.

1. To prepare students for leadership roles in addressing ever-changing and increasingly global natural resource and environmental concerns.
2. To promote a learning environment that values diversity of thought and culture, developed through educational opportunities that include hands-on field and laboratory experiences, require development of written, oral, quantitative, and visual communication skills, as well as problem-based experiential and service-learning in individual and team projects and study abroad.
3. To prepare students to be lifelong learners who contribute to the improvement of the environment, quality of life, and environmental sustainability by making connections across disciplines that integrate social, cultural, economic, and environmental perspectives

The NRES program has approximately 95 students currently enrolled. The program has

conferred more than 20 degrees each of the last two years.

The review committee found the self-study to be an excellent summary of the program's achievements over the past review cycle. The committee generally agrees with the Executive Summary in the self-study:

As faculty members of the NRES Steering Committee we have reflected on how well the program is serving our students, the capacity of the NRES faculty to be flexible and attentive to changing needs, and to anticipate future challenges. The NRES faculty members contribute to the program largely out of a personal and professional commitment and work collaboratively to maintain and build this valuable and successful program. Overall, the program is functioning extremely well, with increasing student enrollment, strong student and alumni evaluations of the program, dedicated faculty and staff, and achievements by current students and alumni at UK and beyond. While there are key challenges ahead that stem from a combination of program growth and shrinking resources, the future is also promising because of the tremendous momentum among students, faculty and staff.

The Review Committee has compiled the following Strengths, Opportunities, Limitations, and Recommendations for the program.

INSTRUCTION

Strengths:

- While there are many varieties of administrative structures for interdisciplinary, interdepartmental programs, the NRES steering committee appears to be successful in managing the operations of the program.

- The NRES program's investment in assessing learning objectives and learning outcomes is commendable. There appears to be a mechanism in place to assess the five objectives, both directly and indirectly, on a rotating cycle, as well as to seek more direct measures of assessment (e.g. pre- and post-testing).

- The requirement of hands-on learning experiences, including camps, internships, and research projects, is a strength of the program.

- The NRES advising portal (http://nres.ca.uky.edu/current-students/advising) provides planning documents that allow students the opportunity to track and/or plan their academic program. Unfortunately, many students were unaware of the website.

Opportunities:

- Increased interest in sustainability on campus will result in a demand for relevant classes and sustainability-related curricula. The NRES program should position itself for this movement. Coordination with other sustainability/environment-related programs on campus is recommended.

- Two instructors (Coyne and Sawyer) of NRES-required courses from other departments reported that NRES students sometimes lack preparation (technical/analytical skills) that students majoring in that field already have. NRES could identify those pre-requisite elements and add them to the NRES curriculum or otherwise strengthen preparation (peer tutoring?) for those courses.

Limitations:

- The program has grown to a level of approximately 95 students. The program should be cautious about spreading limited resources too thin. Resource constraints are especially important in courses with substantial lab or field components. The Steering Committee should begin thinking about program size and decide how many students can be adequately served. If excess demand occurs, the program could place academic standards on incoming students.

- Stress is caused by students taking classes too late in their programs or out of sequence. The program should enforce program schedule by creating prerequisites and promote the idea that summer camps/key courses should occur at appropriate points within the program. For example, NRE201 should occur as early in the program as possible. Summer camps or select courses should be prerequisites for upper-level classes.

- Faculty and students had some difficulty in describing the Analytical Skill Development and Environmental Systems Emphasis Area aspects of the program. Could these be shortened to Analytical Skills and Environmental Emphasis?

Recommendations:

- Replacement of CHE107 core class: Concern was expressed that the degree was being devalued by reduced requirements. Rebuild academic strength of the program by requiring CHE107 or developing a core environmental chemistry class to serve students enrolled in NRES and other environmental majors. It should include relevant applied examples with a mixture of organic and inorganic chemistry. Clear guidance should be given to students interested in advancing to graduate programs that Chemistry is a key course.

- Replacement of STA291 core classes: Statistics should be reinserted into the program by developing new courses or building environmentally related statistical elements into existing courses.

- Increase the scope of internships and research opportunities: Enhanced networking with a broader group of potential employers with varied topics would be a benefit. Increase visibility of the program to students and potential employers. A mechanism for helping students with an interest in a potential focus area to be matched with interning organizations would be beneficial.

- Create courses or add topic areas in existing courses to introduce surveying and field taxonomy.

- Clearly identify course-sequences needed to achieve relevant professional certifications.

RECRUITMENT AND RETENTION FOR UNDERGRADUATE STUDENTS

Strengths:

- An Academic Coordinator, funded as the result of the last program review, has been effective for student recruitment visits, informal advising, building personal relationships, and the development of special events.

Opportunities:

- The sustainability focus on campus including the Student Sustainability Council and other student organizations provides an opportunity to attract students to the NRES program.

- The Living/Learning Center in the new dormitory complex called “Greenhouse” provides an opportunity to recruit new students and enhance the visibility of the NRES program.

- The NRES program should be proactive in developing and providing information about the program to Undergraduate Studies offices, high school guidance counselors, CAFE recruitment nights, and college recruiters.

- A large proportion of NRES students indicated an interest in graduate study. The program could facilitate this by providing targeted advising/resources, such as a panel discussion representing various fields.

Limitations:

- The review committee often found that students did not know of existing websites or services available. The NRES program and the Academic Coordinator should strive to increase the visibility of the program during the next review cycle. This can be accomplished by enhanced use of social media, networking with alumni, and creation of a visible home for program that provides an attractive meeting space.

- As a result of limited visibility, a large number of students enter the program as transfers. This compresses time and causes classes to be taken out of sequence. The program needs to work on visibility to increase freshmen numbers.

Recommendations:

- The NRES program should work with other environmental programs on campus to create a "one-stop shopping website" that describes and links to all environmental and sustainability related programs. The site should describe careers associated with each degree option and what may be needed to get into graduate school.

- The NRES advisors and Academic Coordinator should nominate NRES students for the CAFE Student Ambassador Program. The ambassador program can be a mechanism to add visibility of the NRES program and the students in NRES.

- The NRES program should work with the Development Office to form NRES targeted gifts. These could fund NRES-specific merit-based scholarships for incoming freshmen.

FACULTY AND STAFF DEVELOPMENT/RECRUITMENT

Strengths:

- Based on review comments and the self-study comments, the NRES faculty seem to be incredibly dedicated to the success of the program.

- The interdepartmental nature of the program seems to be successful with no one department controlling the curriculum.

- The review panel was impressed with the relationships that have developed among the faculty in the various departments. The NRES program is a model of a self-sustaining and supportive interdisciplinary undergraduate program.

- The hiring of an Academic Coordinator has been a strong boost to many aspects of the program. Attention to her development and retention, as well as how best to allocate her time, is a key for continued growth and success of the program.

Opportunities:

- NRES is a well-established program that is supported by excellent faculty and staff. Faculty can easily evaluate the 'give-get' relationship to decide if the program is an opportunity for them. Recent inclusion of additional faculty has been a positive experience. As the program grows, additional faculty may be recruited.

Limitations:

- The reliance on tenure-track faculty for key course teaching and advising may put them at risk for receiving tenure. Make sure their DOE is in line with efforts and that administrators support their participation.

Recommendations:

- An aspect of any strong interdisciplinary program is the participation of key faculty and departments aligned with the program. Teaching responsibilities specific to NRES should be written explicitly within job descriptions for faculty hires (or reassignments) along with formal consideration given in the P&T process. There needs to be an enforceable mechanism for honoring these commitments so that resources are not pulled back when departmental resources are scarce.

- As the program continues to grow, the Steering Committee should evaluate the use of faculty and staff time to achieve advising, teaching, promotion, and communication goals. The program could consider expanded use of adjunct professors to meet teaching needs.

- Consider use of graduate assistantships to lessen the burden on faculty. Assistants could support high enrollment core classes and possibly allow the program to increase class size of field or lab based courses.

- Some inconsistencies were noted by faculty and students regarding advising. The NRES Steering Committee should study other models of advising being performed by faculty and academic coordinators in the college. Consider modifying the advising model to ensure that early phase advising provides essential guidance.

FACILITIES

Strengths:

- The Department of Forestry provides a computer lab and classroom space for NRES students. A shared student lounge is available for Forestry and NRES students in the Forestry building. Additional classroom space is found in other departments in CAFE.

- The Robinson Forest field camp is an important resource for the NRES program in the state. The recent addition of a field camp experience in Costa Rica has been an added strength.

Opportunities:

- The Ag Information Center in Ag Science Center North is underutilized space that could be transformed into usable office or meeting space for interdisciplinary programs.

- The UK master plan indicates potential new buildings on South Campus that could be used for interdisciplinary programs. A prototype structure has been drawn that could include the NRES program and other environmental programs in CAFE. CAFE should advocate for this structure to fill future needs.

Limitations:

- Although the Academic Coordinator's office space is generously provided by the Department of Forestry, it is an inadequate space and not ideal for meeting with students and parents.

- There is not a perceived "home" for the program as students must take classes in many buildings in CAFE. In some cases, students must travel long distances to go to various classes.

- Quality of classroom and meeting space in Forestry is poor. Students lack meeting space to work together on project work after 5:00 p.m.

Recommendations:

- The CAFE should provide joint space for interdisciplinary programs (e.g. ABT, NRES, SAG) in the Ag Information Center or other centrally located space. This could increase program visibility and access. Space could house the Academic Coordinators for each of these programs, provide for student work space, and allow for meetings with students, parents, and faculty.

- Consider moveable partitions to create office space within the Ag Information

Center – this could be a cost effective solution that allows for maximum flexibility for future space usage.

- The CAFE administration should support a long-term vision to build an environmental science facility to house NRES and supporting departments contributing to this and other multi-disciplinary programs.

EXTERNAL PARTNERSHIPS/ALUMNI/STAKEHOLDERS

Strengths:

- The Academic Coordinator has provided additional capabilities to foster internships, alumni relationships, and recruitment.

Opportunities:

- Alumni want to give back to the program and have a strong sense of camaraderie. Social media can be a resource to interact with alumni to increase communications.

- NRES should reach out to cooperative extension to identify student opportunities.

Limitations:

- The self-study highlighted a difficulty in building an effective alumni database. Discussions during the review with alumni confirmed that more work is needed in this area.

- Alumni described the inability to give money to the NRES program. The NRES program does not seem to be in the Development Office database.

Recommendations:

- The Academic Coordinator and the Steering Committee need to devote time to building the alumni database. Social media can be used to make contacts. Alumni and students can be asked to help with this important activity.

- The NRES program needs to contact the CAFE Development Office to set up one or more NRES gift possibilities. Alumni need to feel as though the NRES program is a valued part of the college.

- The program should develop alumni profiles that showcase attractive future employment options and post these to YouTube and link to the website.

- Increase participation of prospective NRES employers in career fairs.

RESOURCE/BUDGET NEEDS

Strengths:

- The NRES program has had historically strong support from the College and the Provost based on the recent addition of an Academic Coordinator and targeted hires in the past.

Opportunities:

- Given the limited database of alumni, there seems to be untapped development opportunities with alumni.

Limitations:

- The proposed change in the budget model for the university was a concern in the self-study and a concern discussed during the review.

- The Steering Committee needs to look closely at program size and decide how much further the program can grow. Issues that need to be addressed related to program size are classroom space needs, faculty time available, internship opportunities, and limitations resulting from the capability to effectively handle field courses.

Recommendations:

- The CAFE administration needs to ensure that NRES and other interdisciplinary programs remain solvent under the new budgeting framework. In many cases, students in these programs would be lost to the college if the interdisciplinary programs were not available.

- There needs to be a clear, explicit commitment made and message given by the Dean and upper administration, and by all contributing department heads, that the interdisciplinary NRES program is valued and worthy of consistent support. This support should include strategic faculty hires to cover classes with increasing enrollments and staff support to manage enrollment, internships, recruitment, retention, and advising

Implementation Plan

UK Program Review Implementation Plan

*This **required** form is described as Appendix A in AR II-I.0.6.*

College/Unit: Natural Resources & Environmental Science **Date:** April 21, 2014

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
Instruction: Concern was expressed that the degree was being devalued by reduced requirements. Rebuild academic strength of the program by requiring CHE107 or developing a core environmental chemistry class to serve students enrolled in NRES and other environmental majors. It should include relevant applied examples with a mixture of organic and inorganic chemistry. Clear guidance should be given to students interested in advancing to graduate programs that Chemistry is a key course.	E	R	The decision to drop CHE 107 from the curriculum was based on evaluation of the course itself. Rigor is maintained in the program through other courses that have chemistry content, including PLS 366, FOR 340, FOR 460. Students interested in grad school will be advised to take more than the required chemistry.		NA
Instruction: Statistics should be reinserted into the program by developing new courses or building environmentally related statistical elements into existing courses.	E	A	A new UK Core course, STA 296, will replace the current requirement for STA 210.	Will submit a minor program change form.	Fall 2014
Instruction: Increase scope of internships and research opportunities through enhanced networking with a broader group of potential employers and varied topics, increased visibility of the program to students and potential employers, development of a mechanism for matching intern organizations to curricular focus areas	E	A	Students are currently required to link internship/research experience to focus areas. Networking is supported through the annual NRES Internship Forum. We concur fully with this recommendation, and are continually working to accomplish these goals.	This is ongoing. Additional resources are needed to enhance this activity beyond what we are currently able to do.	NA
Instruction: Create courses or add topic areas in existing courses to introduce surveying and field taxonomy	E	R	Not sure what is meant by 'field taxonomy', but we do currently offer Plant Taxonomy as NRE 420G, and Soil taxonomy is covered in PLS 366 and NRE 320, and wildlife taxonomy is included in several different courses.	If resources were to become available for adding courses, we would develop and prioritize possible courses through the Steering Committee.	NA

Instruction: Clearly identify course-sequences needed to achieve relevant professional certifications.	E	A	The only certification that is currently relevant is Wildlife Certification, offered through The Wildlife Society. We have a nearly completed example program to aid students in accomplishing this. Forestry now offers sufficient courses to support this certification.	NRES will complete the process of identifying curriculum plan for students wishing to do this. Dr. John Cox has been supporting this effort along with the NRES AC.	Fall 2014
Recruitment and retention: NRES program should work with other environmental programs on campus to create a one-stop shopping website. The site should describe careers with each degree option and graduate school opportunities.	E	A	Great idea. We have been trying to accomplish a one-stop website for over a year. The challenge is to figure out who on campus can create and maintain this webpage. We need someone from within CAFE to help spearhead this goal.	Need help from CAFE and connections to campus-wide web design to create and maintain this resource. We are also working to finalize 2x2 program with BCTC.	?? (Depends on CAFE support) Fall 2014 (BCTC)
Recruitment and retention: NRES advisors and Academic Coordinator should nominate NRES students for CAFE Student Ambassador Program.	E	A	We nominate students every year, but they are not accepted to the program.	Will continue to do this. In addition, we will contact the only NRES Ag Ambassador in recent history to ask her whether she found this role to be useful in recruiting NRES students. If we find that this is, indeed, a valuable role for the NRES program, we will further pursue what we need to do differently to have our students selected as Ambassadors.	Ongoing
Recruitment and retention: NRES Steering Committee members and Academic Advisor should identify and pursue alternate pathways of recruiting new NRES students.	I	A	We need to continue to find alternative pathways for recruiting students to the NRES program, not only to combat the loss of students to the ENS program, but also to better recruit students as freshmen, rather than later in their undergraduate careers.	We will follow up on the suggestions of Associate Dean Henning regarding better utilizing the Ag Extension network and 4-H programming to recruit students. However, these activities will need to be with surrogates, rather than current NRES personnel because (1) we don't have control over the time faculty contribute to NRES, and (2) the Academic Coordinator is already stretched with current responsibilities.	
Recruitment and retention: NRES program should work with Development Office to form NRES targeted gifts to fund NRES-specific merit-based scholarships for incoming freshmen.	E/I	A	We have initiated plans to do this.	Will continue to work to establish capacity to collect NRES-targeted gifts. However, it bears noting that this is another task that falls to a program without any dedicated administrative assistance.	Ongoing
Fac/staff development/recruitment: Teaching responsibilities specific to NRES should be written explicitly within job descriptions for faculty, along with formal consideration within P&T process and develop an	E	A	We would continue to support this goal.	Work with CAFE Dean to build NRES teaching responsibilities and Steering Committee service into faculty position descriptions. We will work to develop a list of all	Ongoing August

enforceable mechanism for honoring these commitments so that resources are not pulled back when departmental resources are scarce.				faculty whose hiring was in some way tied to the NRES program, regardless of their current association with the NRES program either as a SC member or instructor of an NRES course. We will plan to submit this list to the Dean for her evaluation and endorsement.	2014
Fac/staff development/recruitment: Steering Committee should evaluate use of faculty and staff time to achieve advising, teaching, promotion, and communication goals. Program could consider expanded use of part-time instructors to meet teaching needs.	E	A	Use of fac/staff resources: Reallocation of current personnel resources is a zero-sum game. More of the AC's time is needed for enhanced recruitment, student contact, alumni development, student advising and academic enrichment opportunities. However, there are no additional resources available to offset her current responsibilities. We already use student assistants to write and produce the newsletter, update social media, and help develop alumni contacts. Part-time faculty: We currently do this. For example, we hired a Part-time Instructor to teach NRE 390 Environmental Education, rather than having the Academic Coordinator teach another course. AC was hired partially to contribute to summer camp, but since her hire, contribution from Forestry faculty member has been reduced, so that she is now occupied the full three weeks, plus for preparation.	The NRES program added an Academic Coordinator three years ago, but since that time we have lost faculty (Dr. Grabau became Associate Dean), and have seen an erosion in support of the program in the form of administrative assistance. A more formal connection to administrative assistance in the College would be a significant help. For example, in the past Cathy Bowers provided NRES support, as did the Forestry Administrative Assistant to the Chair.	
Fac/staff development/recruitment: We suggest that the College Administration re-evaluate the resources that the NRES program receives to consider a part-time role for a dedicated administrative assistant.	I	A	The structure of the NRES SC has worked incredibly well for the past 20+ years to create, build and implement the NRES program. However, it may now be a somewhat outdated model as changes within the University have led to increased expectations for the delivery of undergraduate programs and heightened competition for undergraduate students interested in natural resources and environmental science.	Work with the College administration to envision and implement a plan to add a part-time administrator to the NRES program structure to aid us in completing purely administrative tasks that currently fall to faculty and the AC, such as: ordering equipment, uploading documents to the NRES webpage, emailing job and internship announcements to NRES students and alumni, ordering food for events, updating the student listserv, etc.	
Fac/staff development/recruitment: Consider use of graduate assistantships to lessen the burden on faculty to support high enrollment	E	R	Because NRES is a program and not a department we don't have the funds to support graduate TAs. However, Forestry supports several TAs who work with		

core classes.			Forestry faculty in support of NRES core classes. There has been some push-back on this; not sure where it will lead.		
Fac/staff development/recruitment: NRES SC should study other models of advising being performed by faculty and ACs in CAFE; consider modifying the advising model to ensure consistent, quality advising.	E	A	The NRES SC will explore models of advising currently in use in CAFE and consider modifying the current approach.	The NRES Steering Committee will examine the roles of other ACs in the College and consider modifying our approach to advising.	Fall 2014
Facilities: CAFE should provide joint space for interdisciplinary programs in Ag Information Center or other centrally located space to increase program visibility and access.	E	A	The NRES program would benefit greatly from improved space to house the AC, space for students to convene, and space to facilitate meetings with students, parents and faculty.	Need support from CAFE to identify and prepare a suitable space.	??
Facilities: Consider moveable partitions to create office space within the AIC as a cost-effective means of solving the recommendation above.	E	A	This space would ideally include office space for part-time use by the NRES SC, Chair and DUS, as well as full time space for the AC. Office space for the AC will need to be private for conversations with and about students and student 'issues'.	Need support from CAFE to identify and prepare a suitable space.	??
Facilities: CAFE administration should support a long-term vision to build an environmental science facility to house NRES and supporting departments	E	A	NRES SC should work together with CAFE administration, and be included in, discussions about future space for environmental science programs in CAFE.	The NRES SC faculty would be pleased to participate in any visioning processes regarding future space.	
External Partnerships/ Alumni/Stakeholders: AC and NRES SC faculty need to devote time to building alumni database with assistance from alumni and students and including use of social media.	E	A	AC and NRES faculty are pretty fully occupied with current responsibilities. Even so, we have been working to develop our alumni database and improve our social media with support from two NRES student assistants. We do not see a faculty role for building the alumni database or developing improved use of social media, beyond guiding student assistants or other personnel.	We will continue to build the alumni database and improve social media, relying on NRES Student Assistants to do the legwork, and developing our capabilities in these areas.	Ongoing
External Partnerships/ Alumni/Stakeholders: NRES program needs to contact the CAFE Development Office to set up NRES gift possibilities, and to enhance sense among NRES alumni that the program is a valued part of the college	E	A	We have initiated the process of creating a gift account, with a plan to seed the account with t-shirt sales this spring (2014). Need support from Ag Development Office to bring this to fruition in a meaningful way, and to build on the desire of our alumni to contribute back to the NRES program.		
External Partnerships/ Alumni/Stakeholders: Develop alumni profiles that showcase future employment options and post these	E	A	We currently highlight 1-2 alumni in every NRES newsletter, which is produced 2x/year. We are in the process of purchasing a GoPro camera that will	We would like to do this, but would need additional support from CAFE.	

to YouTube and link to website.			facilitate video production. With support from Ag Communications we could produce alumni profiles and post them to our website and more broadly.		
External Partnerships/ Alumni/Stakeholders: Increase participation of prospective NRES employers in career fairs.	E	A	Geri Philpott, NRES AC, has worked closely with CAFE Office of Instruction to increase participation of prospective NRES employers in NRES career fairs.	Need additional support from CAFE to improve this.	Ongoing
Resource/budget needs: CAFE administration needs to ensure that NRES and other interdisciplinary programs remain solvent under the new budgeting framework.	E	A	We agree.		
Resource/budget needs: Need a clear, explicit commitment by CAFE Dean, upper administration, and all contributing department heads that NRES program is valued and worthy of consistent support. This support should include strategic faculty hires to cover classes with increasing enrollments and staff support to manage enrollment, internships, recruitment, retention, and advising.	E	A	"…Staff support to manage enrollment, internships, recruitment, retention, and advising." As we are not a department, we don't have the base level support staff to give this enough attention. Department chairs have attended past NRES SC meetings and have expressed support; converting this support to concrete staff effort to manage internships, recruitment, and retention will require additional resources.	Continue to invite affiliated chairs to SC meetings. Maintain and strengthen collaborative ties and plan discussions about possible faculty co-hires in growth areas (for example, renewable energy).	Ongoing

*** Source of Recommendation (I = Internal recommendation; E = External Review Committee recommendation; H = Unit Head recommendation)**
**** Accept/Reject Recommendation (A=Accept; R=Reject)**

Unit Head Signature: _____ **Unit Head Supervisor Signature:** _____ **Date:** _____

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