



**Natural Resources and Environmental Science
Program Self-Study Report
2015-2020**

Submitted to:
Dean Cox and the 2021 NRES Program Review Committee

March 8, 2021

Natural Resources and Environmental Science (NRES) Program

Executive Summary

The goal of this self-study of the Natural Resources and Environmental Science (NRES) B.S. program is to provide a reflective assessment of strengths and impending challenges facing the program in order for the review team and the University of Kentucky College of Agriculture, Food, and Environment (CAFE) administration to evaluate and weigh in. This interdisciplinary program relies heavily on faculty and staff members from affiliated departments and units committed to advise and teach students to think critically and make broad connections across disciplines. Overall, the program is functioning very well. There are some key challenges which lie ahead that stem from program growth coupled with dwindling resources. However, the program's outlook is bright due to positive contributions from a vibrant steering committee and students.

Self-study process

Organizing and planning for the self-study began in Fall 2020 when the college's Office for Faculty Resources, Planning, and Assessment (OFRPA) met with the NRES steering committee chair and the review team chair to lay out the process. The NRES steering committee (SC) recommended names of individuals to serve on the review team committee. After approval of the recommendations by Dean Nancy Cox, the review team was finalized by the OFRPA. Leadership for this self-study was provided by the NRES Steering Committee, under the coordination of NRES SC program chair Dr. Chris Matocha. He provided the overall approach and laid out the primary document with key data analysis. The process was highly collaborative from the outset, with extensive discussions taking place at official NRES SC meetings about the program's strengths and challenges vis-à-vis serving students. Writing of the self-study was also collaborative, with the program leadership coordinating the process, but also involved the engagement of numerous NRES SC members drafting multiple, significant sections of the report. Drs. Mary Arthur, Chris Sass, Chris Shepard, Sandra Broadus, and Lynn Phillips were particularly instrumental in this way. Deb Ramey of the Center for Student Success (who keeps watch on the program's accounts) provided a six-year summary of the three key NRES-related accounts. The twin surveys of NRES students (current) and alums were also a collaborative effort among the NRES program's academic coordinator (Dr. Adia Sovie), the alumna representative on the NRES SC (Sandra Broadus), Dr. Larry Grabau, and Elizabeth Vaughn (Associate Senior Director of Philanthropy). Brian Volland (Agricultural Communications Specialist) pulled together our video montage of our facilities overview. Tricia Coakley (Assistant Director of Planning and Assessment) was deeply instrumental in coordinating this process at the college level (we could not have completed this self-study without her assistance). She was supported in this role by Megan Lucy (Assistant Director of Faculty Resources), along with Dr. Brian Lee, Associate Dean for Faculty Resources, Planning and Assessment).

NRES Steering Committee members and affiliations

Dr. Chris Matocha (Plant and Soil Sciences), Chair, NRES Steering Committee
Dr. Larry Grabau (Plant and Soil Sciences), Director of Undergraduate Studies
Dr. Chris Barton (Forestry and Natural Resources)
Ms. Sandra Broadus (UK Alternative Transportation)
Dr. Dave McNear (Plant and Soil Sciences)
Dr. Dave Moecher (Earth and Environmental Sciences)
Mr. Rob Paratley (Forestry and Natural Resources)
Dr. Lynn Phillips (Geography)
Dr. Steve Price (Forestry and Natural Resources)
Dr. Chris Sass (Landscape Architecture)
Dr. John Schieffer (Agricultural Economics)
Dr. Chris Shepard (Plant and Soil Sciences)

Program History, Mission, Vision, and Goals

There is general recognition that to solve complex environmental problems, one must integrate knowledge across disciplines and train undergraduate students to make connections. The NRES program began in 1990 as an individualized interdisciplinary undergraduate B.S. degree which was then named Natural Resources Conservation and Management. The original architects of the program were Drs. M. Scott Smith (Chair of then-Agronomy Department) and Bob Muller (Chair of then-Forestry Department) and it was approved as a degree program by the Council on Higher Education in 1996. It has undergone three major curriculum revisions (2004, 2009, 2013) and the name was changed to NRES after the 2009 revision.

The primary mission of the NRES program is to educate undergraduate students about the connections between natural resources and environmental science. 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 train professionals to develop science-based solutions addressing natural resource and environmental problems 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, 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 improvement of the environment and quality of life and environmental sustainability by making connections across disciplines that integrate social, cultural, economic, and environmental perspectives.

Connection with the Mission and Goals of the CAFE and University of Kentucky

The mission of the NRES program is tied to the first goal of the CAFE 2015-2020 strategic plan, which is to **prepare highly motivated and culturally adaptive graduates who are competitive in a global economy and support societal values**. It also aligns well with the first objective of the University of Kentucky's 2015-2020 Strategic Plan, which is to promote **experiential learning** as a metric for undergraduate student success. The primary contribution of the NRES program is to educate students to apply knowledge in natural and social sciences to solving natural resource and environmental problems in an ever-changing and increasingly globally connected world.

Administrative Structure of the NRES BS Program

The decision-making body for the NRES program is the NRES Steering Committee (SC), which provides oversight for all facets of the program, including curriculum changes, course changes, course substitutions, advising information, and experiential learning opportunities. The SC is composed of faculty and staff from several departments and two colleges, appointed by the Associate Dean of Instruction in the College of Agriculture, Food and Environment (CAFE) following consultation with the chairs or administrators of the relevant departments. Currently, SC members have primary appointments in one of four departments in CAFE (Plant and Soil Sciences, Forestry and Natural Resources, Landscape Architecture, and Agricultural Economics), and from two departments in the College of Arts and Sciences (Earth and Environmental Sciences, and Geography). A staff member from the Transportation Services Administration, an alumna of the program, also serves on the SC. The SC is currently made up of 12 members, including the SC Chair and the Director of Undergraduate Studies (DUS). There is no set number of SC members; rather, the number of SC members has grown slightly to address both increased administrative complexity and numbers of students enrolled. There is also one full-time staff person, an Academic Coordinator (AC). In addition, the NRES program employs 1-3 part-time undergraduate Student Assistants who plan, write and publish the bi-annual NRES newsletter and perform other tasks as needed. The AC and Student Assistants all participate as non-voting members of the NRES SC; students leave the meeting before any discussions of individual students are conducted.

The SC Chair is responsible for representing the program at all levels of the college and university. The chair has the specific responsibility of calling and leading SC meetings, supervising the AC (position description in Appendix 13), 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. In addition, it is largely the responsibility of the SC Chair to identify and recruit potential new SC members, often in consultation with other

SC members, department chairs, and the Associate Dean of Instruction. The SC Chair then makes recommendations to the Associate Dean regarding the make-up of the SC, whose members are appointed by the Associate Dean. While there are no term limits, either for membership on the SC or for length of service in the roles of SC Chair or DUS, it is instructive that the last two chairs have served in the role for 10 years each. The first two chairs served for 2 and 4 years, by our best recollection. The current NRES SC Chair started in January 2020. The Distribution of Effort (DOE) assigned for this role has also varied over the years, typically ranging between 10 and 15%. The most recent past chair had 15% of her DOE assigned to the role of chair, the highest assigned for any NRES Chair, and reflecting the increased workload that the addition of the Academic Coordinator, newsletter editor and supervision of NRES student assistants, and greater on-campus advocacy required. The current chair has a 10% DOE for the role; the role of newsletter editor and supervision of the NRES Student Assistants is now the responsibility of the NRES AC.

The primary role of the DUS is to oversee curricular issues and student administration. The program has had 5 people serve in the DUS role, all of whom have been in the department of Agronomy/Plant and Soil Science, with the exception of Dr. Brian Lee, who was in the Department of Landscape Architecture at the time he served as the NRES DUS (he is now an associate dean). The current DUS has 15% of his DOE assigned to the role. The DUS coordinates faculty advising, creates an advising “worksheet” with guidelines for advisors prior to Fall, Spring, and Summer advising periods, and is accessible and responsive to advising or curriculum questions that arise. The DUS serves as an advocate for the program and works with the SC Chair and Academic Coordinator to prepare curriculum revisions and preserve the academic integrity of the NRES program. The DUS manages the transition process for students from program-entry advising (handled by the AC) to faculty advising. See Appendix 14 for current distribution of advisees among advisors. Faculty advisors are assigned based primarily on students’ expressed post-graduation plans (to match, as well as possible, advisors’ areas of expertise) and secondarily to maintain sustainable faculty-to-advisee ratios to promote high quality advising. It should be noted that the NRES program has hewed to a faculty advising model throughout its history. With the addition of an AC in 2011, some of the advising load was shifted to the AC, particularly as faculty were often unavailable during the summer advising sessions due to research commitments away from campus. As the program has grown, the advising load has increased commensurately, becoming unsustainable for some faculty. As a result, more recently and under the guidance of the two previous DUSs, the program shifted to a hybrid model, where in the AC is the advisor for all students when they first enter the program, whether as first-year, transfer, or readmitted students. After conclusion of the first year, students are then shifted to a full-time faculty adviser who will remain their primary adviser and advocate until graduation.

Experiential learning through internships has always been a hallmark of the NRES program, well before the college’s mandate for a graduation requirement for experiential education. As the program grew, it became essential that a member of the NRES SC serve as the Internship Coordinator. The person in this role is responsible for overseeing the NRES internship program and annual Internship Forum discussed further below.

As noted, there are no explicit term limits for faculty and staff serving on the NRES SC. Some have served since the inception of the program. Faculty and staff come to service on the SC through a variety of pathways. Soon after the program first started, in 1990, faculty hires within the College were often made with an explicit mandate, coming from the Dean's office, to hire a faculty member who could and would fulfill the needs of the home department for that position, *and* to contribute, typically through teaching, advising and often SC membership, to the NRES program. This provided a particularly enticing opportunity for new faculty for whom an interdisciplinary undergraduate program in natural resources was a good fit for their academic interests, and while still maintaining their tenure home department. More recently, new faculty position descriptions in the College have not included such explicit expectations for involvement with the NRES program. In the absence of those explicit ties during the hiring process, adding new members to the NRES SC is contingent up the SC Chair, with the help of engaged SC members, recruiting from the faculty ranks. As a result, this recruitment process takes on a form of negotiation between the (essentially powerless) NRES SC Chair, the prospective SC member, and the affected department chair. Upon agreement of a faculty member to join the NRES SC, it has become customary to also get a letter of support from respective department chairs to affirm and support faculty engagement within the NRES program.

Current Constraints and Needs: NRES program administration and leadership

The NRES program has struggled with the challenge of filling leadership positions on the NRES SC. It seems likely that one reason this has become more challenging is that faculty are no longer hired with the explicit expectation of contributing to the NRES program. In addition, in a climate of shrinking resources and faculty lines, coupled with increased student enrollment, department chairs are holding their faculty resources more closely, and are therefore less willing to commit to having (especially junior) faculty expend time on a program that is outside of the home department. The current NRES SC Chair committed to only 2 years of service (compared to the longer periods served by the three previous SC Chairs), and the program was without a DUS for a year after the previous person in this role moved to an associate dean position. The current DUS, a former Associate Dean of Instruction, and previously the DUS for the NRES program, stepped into the role in Fall 2020, but will likely only serve for ~2 years. In some cases, other administrative responsibilities preclude faculty from assuming a leadership role in NRES. For example, one of the NRES SC members was appointed as the Director of Graduate Studies for the Forestry and Natural Resources department prior to earning tenure and promotion to Associate Professor. Another SC member who previously served as the NRES DUS created a new undergraduate program in Plant and Soil Sciences and serves as the DUS for that program (while remaining a vital member of the NRES SC). A third faculty member may soon be tapped for a leadership role in his department, which would preclude his servings in either of the two key leadership roles in the NRES program. The current situation is unsustainable and threatens the future viability of the program.

Throughout the history of the NRES program there have been concerns over how program costs would be shared among the departments. This took on a new urgency when, in 2017, the Department of Forestry changed its name to the Department of Forestry and Natural Resources (FNR). This led to concerns about turf battles and concerns that FNR was aiming to subsume the NRES program. This threat, real or perceived, was met by resistance to the name change, which

ultimately was assuaged by an agreement, brokered by the UK Senate, to forge a memorandum of agreement (MOA) between the chairs of the NRES program and the FNR department, signed as well by the Dean of CAFE. Over the course of the next year, all four affiliated CAFE departments similarly entered into MOA agreements with the NRES program. As noted elsewhere, similar MOUs have not been solicited from collaborating departments in A&S (GEO and EES), or from other departments elsewhere.

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. Despite reassurances from different administrative levels that interdisciplinary programs are valued and will continue to be supported, there is ongoing worry about faculty being stretched too thin. In the past, the program has turned to part-time instructors, often professionals working in the community whose expertise fits well with a needed course. The NRES program has afforded this additional cost through tuition rebates that came back to the program from summer tuition. However, this income stream has been cut off as of this year, due to a University-wide decision to recoup summer tuition funds rather than re-allocating a portion back to the hosting department. This change in allocation of summer tuition resources will also likely have negative impacts to the NRES summer field experience in Costa Rica.

Current challenges and broad recommendations of the NRES Steering Committee

This NRES self-study process has revealed challenges that are principally tied to the ever-present concern about availability of resources to support this growing program. This is especially relevant in light of new budgetary configurations recently implemented by the University of Kentucky. The allocation of funds to this interdisciplinary program has already been impacted by the elimination of summer tuition revenue return to individual programs, thus removing one of our important sources of funding. Initial projections of university-level allocations have indicated a negative fiscal impact on NRES. Despite this overarching concern, we are encouraged by past support of the NRES program by affiliated faculty and their respective departments, and the College of Agriculture, Food, and Environment.

There are three primary challenges regarding the potential to maintain and build the NRES program. The Steering Committee presents the identified challenges below, accompanied by their associated Steering Committee recommendations for the Review Committee's consideration. The Review Committee's thoughts concerning actions to address these challenges are appreciated as a critical aspect of the review process.

- (1) Instructor shortfalls could present an impending challenge caused by growth of NRES student enrollment coupled with implementation of new budgetary configurations. There has been a general upward trend in enrollment in the NRES program, with a 19% increase over the past 6 years. There are several courses with a hands-on field component nearing capacity which will necessitate inclusion of additional offerings (NRE 201, NRE 320); larger class sizes for such courses, we believe, will degrade student learning. Furthermore, the recent promotion of a steering committee member (and past Director of Undergraduate Studies) has left a loss in instructional capacity for an important core course for both the NRES program and the Landscape Architecture department (NRE/LA 355). Lastly, one of

the funding streams used in the past to reinvest back into the program, summer tuition return, has been lost. Despite the past support of affiliated departments as indicated by the Memoranda of Understanding (MOUs), emerging budgetary circumstances may strain the ability of chairs to encourage their faculty to be involved in the NRES program.

- Recommend that the CAFE administration develop tangible incentives to departments that have faculty members serving as NRES leadership positions, NRES SC, instructors, advisors and mentors. We are especially eager to see the College make its very best effort to support filling the vacant geospatial analysis position in the Landscape Architecture Department; this would be a critical step toward supporting both that department's core program and the NRES degree program, as this position supports a course required by both programs. See also self-study report section above regarding administration for additional context.
- (2) Concern that the program has historically had low numbers of underrepresented minorities (URMs). Less than 10% of the NRES student enrollment is comprised of URMs, below the CAFE average. Recent studies have indicated the importance of a connection to nature as figuring prominently in the decision of URMs to select a Natural Resource-related major.
- Recommendation to be more intentional about efforts to recruit and retain URMs to the NRES program. Specifically, we intend to undertake a multi-faceted approach to enhance the appeal of the program to diverse students, as well as the program's sensitivity toward environmental issues of interest to such students. We plan to work closely with the CAFE Office of Diversity to create an environment conducive for URM recruitment.
- (3) There may be a missed opportunity to recruit and train strong students for fast-track M.S. degrees in fields closely related to NRES. Given that there is a significant hands-on experiential learning component in the NRES curriculum, motivated students may take upper-level courses to count towards a specific M.S. program in fields closely aligned with NRES. Multiple fast-track program possibilities seem to exist in CAFE and the College of Arts and Sciences; the availability of the University Scholars Program (USP) (which enables high-achieving students to "double-count" up to 12 credits for both B.S. and M.S. degrees) is an attractive mechanism toward this end.
- Recommend the development of multiple, USP agreements with graduate programs within and beyond CAFE and Arts and Sciences (A&S) to enhance the recruitment of highly motivated students to the NRES program, along with enabling such students to earn an additional degree in a fast-track schedule.

Program Initiatives and Progress on Implementing Recommendations from the Last Review

The previous program review occurred in 2013-2014. This program review implementation included committee recommendations in five key areas:

- (1) **Student recruitment into the NRES major has been an ongoing focus.** The NRES program has grown since the last program review (2014), with a 19% increase in enrollment over the 6-year period, with approximately 112 students currently enrolled. This level of enrollment

and continued growth will strain existing hands-on courses, necessitating inclusion of additional sections. Hands-on courses are clearly more effective if modest class sizes can be maintained. Increasing enrollments may impact instructional quality unless additional resources are obtained.

(2) **Improvements to office space used by the NRES Academic Coordinator (AC), as well as additional staff support for the NRES program¹.** CAFE administration identified space in early summer of 2015 for the new NRES AC office in the Equine Suite on the second floor of the Agriculture Science North building. This space is a marked improvement over the previous space allocated to the NRES AC. The Ag North location facilitates more informal meetings with both the Center for Student Success and other AC's. The Department of Forestry and Natural Resources (FNR) continues to provide storage space (for instructional support materials) for NRES program in the TP Cooper building. NRES students also share a lounge with FNR students in the basement of TP Cooper. A new NRES AC (Dr. Adia Sovie) was hired on August 1, 2019. The NRES program has not received any direct additional staff support since the periodic program review. Deb Ramey, in the Center for Student Success, continues to provide essential staff support in tracking budgets and purchases, and in helping with student management and course enrollment. This is an established role for Deb within her overall MJRs². The program also relies on two or three undergraduate students working 5-10 hours/week researching and writing the bi-annual NRES newsletter, which is the only student-produced newsletter in CAFE³ that relies on students for the overall development and coordination aspects of the publication. Our AC works closely with these students to produce the newsletter. The students also help with other program needs, such as helping with staff events, student recruiting, and attending NRES SC meetings to provide insights from a student perspective. Overall, the physical space is working well, and staff support from the Center for Student Success has been very helpful in tracking budgets and purchases.

(3) **There is an ongoing need for recruitment and retention of faculty to the NRES program.** This currently occurs in two ways: when new faculty are hired with potential to contribute to the NRES program, making that connection explicit in the hiring process; and the recruitment and retention of faculty once they arrive on campus. The recent development of MOUs (Appendix 1) between the NRES program and affiliated College of Agriculture, Food and Environment departments (FNR, PSS, LA, AEC) has been helpful to provide institutional memory regarding departmental commitments to supporting this important inter-disciplinary program.⁴ Now confronted with budgetary constraints, there is greater potential for departmental instructional budgets to be impacted and this might hamper further collaboration between affiliated departments and NRES.

(4) **Encourage study abroad options for NRES students.** This has been accomplished using several models: As a University of Kentucky-sponsored Education Abroad learning

¹ Deb Ramey (Scholarship and Financial Manager) of the CAFE Center for Student Success, now has a portion of her official assignment dedicated to budgetary support for NRES and similar CAFE multi-disciplinary programs.

² MJRs, major job responsibilities, a descriptor used by the University of Kentucky to direct staff commitments and evaluations.

³ Equine Science and Management program (ESMA) has a student-focused newsletter that uses content submitted by student authors, while coordination and development is provided by program staff.

⁴ We note that no such MOUs have been solicited from A&S Departments (such as GEO or EES). In addition, no such MOU has been solicited from Biosystems & Agricultural Engineering. Perhaps other departments (beyond these) might also be approached to collaboratively support this multidisciplinary degree.

experience, as a semester abroad, through the NRES field experience in Costa Rica, or through other opportunities. The Costa Rica option has afforded a subset of students to study abroad for the last seven years and has helped students complete the fieldwork requirement for NRES degree completion, since the Robinson Forest option, in some years, cannot support the full number of students needing to complete NRE 320.⁵ In addition, the inclusion of a camp alternative in Costa Rica gives students an opportunity to select this international field camp experience, managed by NRES program faculty on site. Since the inception of the Costa Rica field class tuition return funds from summer camps have been used to provide scholarships to students, and many of our students benefit from this model (see section on budget below) The recent loss of summer tuition return as a revenue stream for NRES will certainly challenge our ability to continue offering this Education Abroad course.

(5) The NRES program could benefit from developing a recurring fund-raising stream, which could be used to support student development, such as travel to professional meetings. In response to this recommendation, an NRES Enrichment fund was created. Additionally, the Chase Parker Powell Memorial Scholarship Fund provides tuition scholarships to NRES students.

Student Enrollment and Degrees Awarded

The NRES program has grown since the last program review (2014), with a 19% increase in enrollment over the 6-year period, with approximately 112 students currently enrolled (Figure 1). The number of students graduating is dynamic, but in general has mirrored ever increasing overall numbers of NRES majors. In 2019, there were 39 graduates. While it is difficult to pinpoint the specific reasons for the historically high enrollment and graduation rates, we suspect that there are several factors at play. An NRES Academic Coordinator (AC) was hired in 2011. The AC identified and implemented several new approaches to recruitment and retention. For example, there is now a concrete plan for students to transfer upon completion of the Environmental Science Technology (EST) program at Bluegrass Community and Technical College (BCTC) to UK, and a commensurate increase in the number of students we recruit from BCTC. We saw a decline in our enrollment in 2015 and 2016, and then a rebound in 2017 which has been sustained. The latter increase, which went up as a proportion of the College enrollment, might stem from the hiring of Wayne Centers (Director of Student Relations) and Seth Riker (Marketing and Communications Manager) in the Center for Student Success in fall 2015, which may also be helping with recruitment.

⁵ Both of our NRES camp versions (NRE 320; Robinson Forest, Costa Rica) were adversely impacted by the COVID-19 pandemic. Robinson Forest was fully virtual (a difficult feat for a field techniques and experiential course!), and, unsurprisingly, Costa Rica was cancelled (due to travel issues).

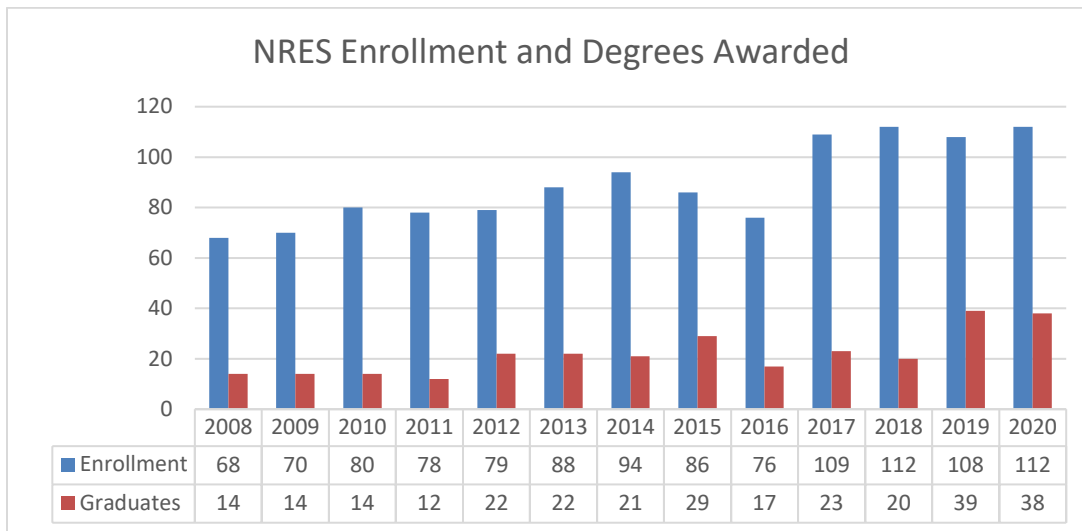


Figure 1. NRES enrollment and graduates since 2008. *Data provided by OFRPA.

Although NRES enrollment has grown 65% since 2008, one area of concern is the low percentage of underrepresented minorities (URMs). For example, the percentage URM (as a proportion of total NRES students) has generally been <10% since 2015 (Figure 2). A more diverse pool of students could translate to a more diverse workforce, and all students could benefit from more diverse voices and perspectives. In addition, enhanced diversity of thought and praxis will better prepare students after graduation. The modest numbers of URM students in our program is addressed more expansively in the Diversity, Equity and Inclusion section below.

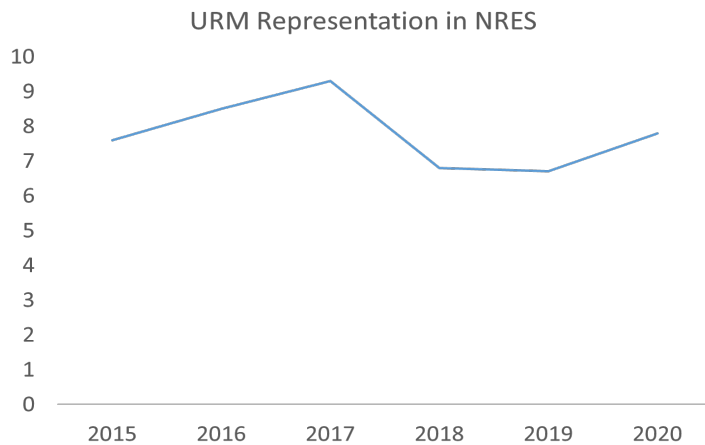


Figure 2. The number of underrepresented minorities (URMs) in the NRES program since 2015.

Demand Analysis for Natural Resources & Environmental Sciences

Program Demand

The increasing enrollment trend noted, especially in transfers to the program, suggest that many students are coming to NRES from majors in the Colleges of Engineering and Arts & Sciences, as well as other majors in CAFE (notably, Animal Sciences). There is also some evidence that the relatively new B.A. in Environmental and Sustainability Studies (ENS) in the College of Arts and Sciences is raising awareness among students of “environmental” programs generally and drawing some students to the B.S. in NRES. This level of enrollment and continued growth will strain existing hands-on courses, necessitating inclusion of additional sections. This will likely impact quality unless additional resources are obtained. We note the possibility that some potential, science averse NRES students might choose to major in ENS, due to its lesser focus on environmental science.

A significant number of students from the Associate of Science Environmental Science and Technology (EST) program at Bluegrass Community and Technical College (BCTC) have built upon their degrees to complete their B.S. degrees in NRES. This community of students add richness to the student body of the NRES program and help grow the numbers of majors. Jean Watts, former chair of EST, has been an outstanding collaborator in this essential linkage between EST and NRES. Appendix 2 details our current transfer agreement with the EST program; we continue (together!) to look for ways to simplify and streamline this collaborative educational effort.

Employer Demand

Students self-select one of six Analytical Skills Development (ASD) areas and one of nine Environmental System Emphasis Area (ESEA) (Appendix 3) that relate to knowledge and skill sets within the natural resources and environmental science arena. The most common self-reported ASD and ESEA categories are Field and Lab Analysis and Soils/Conservation Biology respectively (NRES Graduate Survey, 2020). Providing the ability for students to choose tracks that fit their interest and future professional skillsets allows them ownership in their degree and flexible alignment with the current job market needs. These combinations provide students multiple avenues that they can bring together and begin to see themselves as professionals in varied contexts from environmental education to general field research.

Burning Glass is a market assessment tool that provides data such as number of job postings related to a field of study; number of graduates in that field; specific skills employers look for in those postings; and what skills correspond to higher salaries. The report accesses employment data based on skills identified in the job postings related to specific CIP (Classification of Instructional Programs) codes; however, the NRES program spans multiple fields. We attempted to include as many relevant CIP codes as possible to glean insight on the job market relevant to our students’ abilities and skills. The Burning Glass report for this specific assessment revealed a total of 199,298 job postings in the field over the past year nationwide out of a total of 2.9-million job postings in 2020. Job postings over the next 10-years for these CIP coded areas are

expected to be steady. According to the report, approximately 768 U. S. colleges/institutions provide a similar education and confer approximately 17,500 degrees total among them, averaging 23 degrees per institution. Sixty-nine percent of the institutions are public and perhaps direct competitors to the University of Kentucky’s program. UK’s NRES program over the last 5-years has averaged 23 degrees per year conferring degrees fall, spring, and summer (Figure 3). This number seems to be in line with national trends and allows us to gage our program size, which seems to be appropriate.

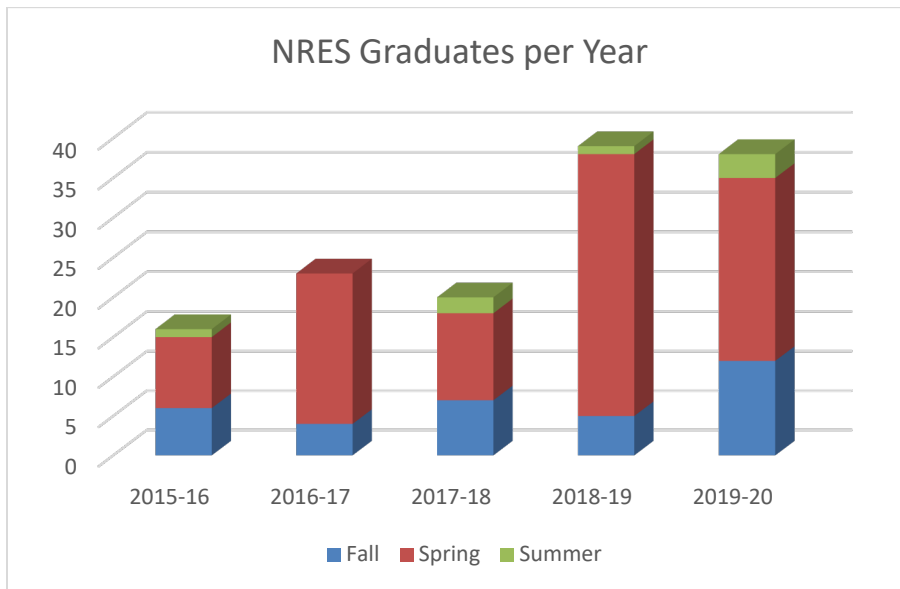


Figure 3. Number of NRES graduates per year in the Fall, Spring, and Summer semesters. Most students graduate in the Spring following their NRES Capstone experience.

Demand for graduates in the natural resources and environmental science fields is strong. Based on the Burning Glass analysis, jobs have steadily increased at the bachelor’s level since 2016 adding over 600,000 jobs and currently sits at 2.9 million jobs nationwide. Growth over the next 10-years is projected to level, staying at 2.9 million nationwide. Most jobs are in the general research sector and require skill sets in technical writing and research, both covered in multiple classes of the NRES curriculum. A bachelor’s degree or below was required for approximately 77% of all listings with only 36% of those listings requiring 0-2 years of experience (Figures 4 & 5). Thus, internships and research opportunities on campus are critical as they provide some countable experience for our graduates. Our students compete with those having higher degrees for the same positions (Burning Glass, 2021).

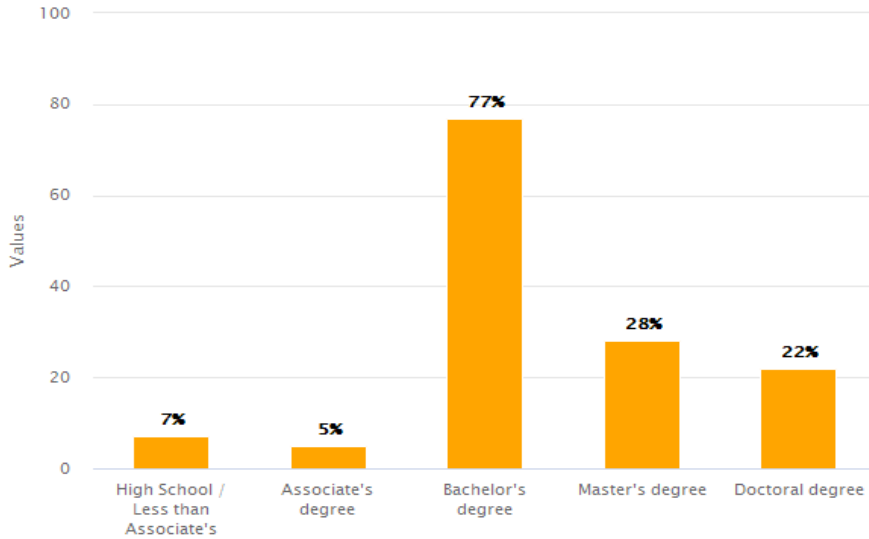


Figure 4. Burning Glass analysis on degree required for posted positions (2021).

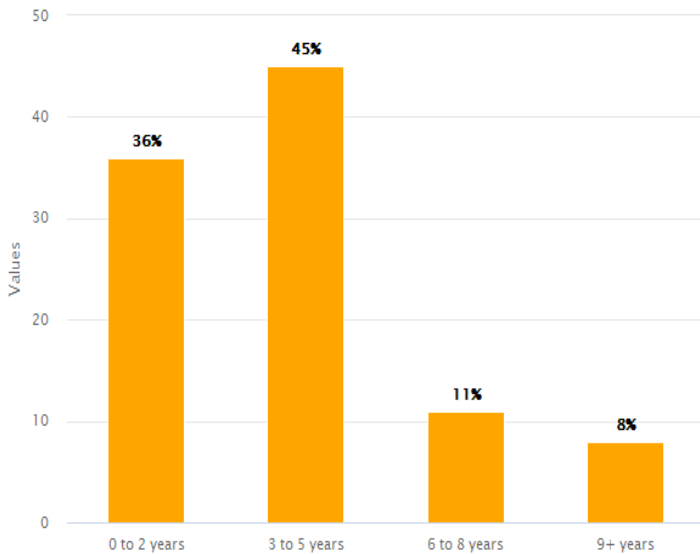


Figure 5. Burning Glass analysis years' experience required (2021).

The Commonwealth of Kentucky is one of 34 states with high demand in the field of natural resources/environmental sciences and ultimately is a net importer of talent, as approximately 81% of our students stay within the Commonwealth to find a position. Average salaries within the field nationwide are \$60,779, well above the average living wage for our region (\$31,450) (Burning Glass, 2021). Overall, we feel that demand for the degree and graduates of the program have increased and will maintain over the next 10-years. This information allows us to continue our efforts in recruitment and retention.

Curriculum Development

The curriculum of the NRES program is arranged to provide a flexible mechanism for students to become broadly trained in the science and policy contexts of natural resources and the environment. Our program builds on the UK Core—the University of Kentucky’s general education program consisting of approximately thirty credits, including one student-selected course each from ten different areas—along with carefully chosen pre-major courses. The core courses of the program, specifically required of all NRES students, include:

- NRE 201, our introductory course,
- NRE 320, our field camp (either in UK’s Robinson Forest or via an Education Abroad configuration, in Costa Rica),
- NRE 355, a GIS course,
- NRE 395 (research) or NRE 399 (internship), an experiential course,
- NRE 400, our visual, oral and written communications course, and
- NRE 471, our issue-based, team-centered senior capstone course.

An additional suite of science and policy courses (see Appendix 3) is required of all students. Upon completion of the foundational/introductory/core courses, each student chooses a pair of “concentration areas”): Analytical Skills Development (ASD) and Environmental Systems Emphasis Area (ESEA) of nine credits each. Appendix 3 shows the multiple options for both ASDs and ESEAs. Notably, students can craft, with advisor and NRES SC approval, a fully individualized ASD and/or ESEA, maximizing flexibility to tailor their own professional and personal journeys. The NRES major map (Appendix 4) provides a semester-by-semester flexible plan, relevant to entering first-year students.

The following material, adapted from the “Why NRES?” page on our program website ([NRES Program Website](#)), explains the curriculum, to help an inquisitive, potential NRES major get the gist of what we are doing with our array of courses.

The NRES degree provides a broad education in the social and natural sciences that underpins natural resources and environmental science. The required focus in an Environmental System Emphasis Area and an Analytical Skill Development area allows students to follow their specific passion, building on the NRES core disciplines. Coupled with the opportunities described below, students emerge from the NRES program with the necessary knowledge, skill sets, and professional experiences that lay a successful foundation for pursuing employment or graduate school. Compared to many other CAFE majors, the NRES curriculum is writing intensive. One of the first courses in the major is NRE 201, Natural Resources and Environmental Science. This introductory course has a component that focuses writing on issues relevant to natural resources and environmental science. Two required science courses, also emphasize writing and students’ skills to analyze and write for scientific and lay audiences. These include FOR 340 (Forest Ecology) and FOR 460G (Forest Hydrology and Watershed Management). NRE 381 (Natural Resource Analysis), requires students to develop skills in writing policy white papers. The NRES curriculum emphasizes experiential learning. NRES students go on field trips. These include the three-week extended field experience that squarely places

students in an outdoor classroom learning from faculty and non-academic professionals. There is also a weekend trip to the Mammoth Cave Region. Many other NRES courses, such as Forest Ecology, also incorporate field exercises and day trips to the field settings. All NRES students also complete a pre-professional, off-campus Internship or Research Project. This provides students with the opportunity to work in a professional context on something that is personally and professionally interesting to them. By connecting their internship or research project with their chosen focus areas, students build strong connections between academic work and application, and develop a network of contacts within their chosen professional concentration area. The Capstone course (NRE 471) encourages students to apply skills and knowledge gained through their NRES suite of courses to a specific natural resources problem. Along the way, students engage professionals and other stakeholders to develop solutions. This promotes skills in teamwork, field data collection, analysis, and oral and written communication. Their Capstone course culminates in a final report and presentation to stakeholders. This professionalization enhances students' portfolios for finding jobs after graduation. Students benefit from one-on-one faculty interactions, which occur initially through student advising and then enhanced through field trips, faculty accessibility, and in some cases, having the same instructor multiple times. The NRES program benefits from a strong network of NRCM/NRES graduates working as professionals across the state. Many of these graduates now offer internships to NRES students, as well as professional positions after graduation.

Student Success Measures and Outcomes

We undertook a direct survey (see Appendix 5) of both current NRES students and past NRCM/NRES students in Spring 2021. The survey was designed to test opinions about their experiences with the program. In particular, we sought their satisfaction with the program, but also (in the case of alums) their post-graduation views on the sufficiency of a B.S. degree alone for ongoing employment and professional opportunities. Among other topics, we also asked questions regarding diversity, equity and inclusion to inform program faculty and staff of potential areas of concern among currently served students. Such information could help us to manage such concerns, while still pressing forward with these key inclusionary measures.

Survey Administration:

We utilized Qualtrics software (Qualtrics, Provo, UT 2021) to administer our survey. We provided an anonymous link to our current students through the NRES listserv, this list has 152 subscribers and is primarily delivered to a student's @uky email address. We reached alumni through two avenues, first we partnered with the Office of Philanthropy and Alumni to contact program alumni through their database (the number of former students contacted was not available to us). Second, the NRES Academic Coordinator, Adia Sovie, directly reached out to 37 recent alumni for which we had recent, non-@uky.edu emails. These students voluntarily provided their emails in the NRES senior exit survey. Some alumni may have received the link from both sources; we saw no evidence that given alumni responded to the survey more than once.

We sent out first request for survey participation to current students on February 15th and followed up with a thank you and reminder on March 1st. The Office of Philanthropy and Alumni sent out a first request for alumni participation on February 22nd with a reminder on March 1st. Adia Sovie reached out to NRES alumni initially on February 24th and again on March 1st. The survey closed on March 4th.

Differences between Alum and Students:

Although 56 total people filled out the survey, only 47 identified which year they started the program, allowing us to determine whether they were current students or alumni. Of those that did self-identify, 28 were alums and 19 were current students.

When comparing these two groups, there were no significant differences on any of the individual responses. Two items, while not significant (at the 0.05 level), did approach significance. That pair of items showed the following trends (note that the statements below are shortened versions of the actual survey items; see Appendix 5 for the full survey).

- “I encounter diverse people in environmental settings”—alums tended to agree more than did current students.
- “NRES program experiences helped me on my career journey”—current students tended to agree more than did alums.

Since the differences between the two groups were not statistically significant, we grouped them together for analysis.

Question responses:

Professional Journey & Continuing Education

The vast majority of students and alum thought the NRES program set them up for professional success, but also indicated that further education and training beyond the program was needed, and a slight majority would have enrolled in a 5 year undergraduate/graduate combination program if they had been given the opportunity.

- 83% of respondents agreed or strongly agreed that the NRES program helped them on their professional journey. (9% expressed no opinion, 8% disagreed or strongly disagreed)
- 57% of respondents agreed or strongly agreed that they needed additional education or training beyond the NRES degree. (27% expressed no opinion, 16% disagreed)
- 73% of respondents agreed or strongly agreed that the breadth of the NRES program helped position them for success in their profession. (18% expressed no opinion, 9% disagreed or strongly disagreed)
- 68% of respondents agreed or strongly agreed that if they had had the chance, they would have enrolled in a 5th year (4+1 format) master’s program. (16% expressed no opinion, 16% disagreed or strongly disagreed)

Program Culture & Advising

The overwhelming majority of students and alum liked their advisors, the NRES advising model, and the ability to know their fellow students.

- 82% of respondents agreed or strongly agreed that the chance to get to know other NRES students was important to them. (5% expressed no opinion, 13% disagreed)
- 87% of respondents agreed or strongly agreed that their advisors were personable and relatable. (4% expressed no opinion, 9% disagreed or strongly disagreed)
- 82% of respondents agreed or strongly agreed that their advisor was well informed about the technical aspects of the NRES program. (9% expressed no opinion, 9% disagreed or strongly disagreed)
- 75% of respondents agreed or strongly agreed that advising communication was straightforward and prompt. (9% expressed no opinion, 16% disagreed or strongly disagreed)

Core Experiences & Coursework

Large majorities of students and alum liked the core experiences like the internship forum, summer camp, and the senior capstone, as well as the flexibility of the program coursework to meet their interests. However, many were split on whether or not a more focused program would have helped them more in the long run.

- 67% of respondents agreed or strongly agreed that the NRES internship forum helped them learn about the many directions a student could take. (27% expressed no opinion, 6% disagreed or strongly disagreed)
- 75% of respondents agreed or strongly agreed that core NRES experiences like camp, internships, and the senior capstone helped them build toward a career in the environment. (14% expressed no opinion, 11% disagreed or strongly disagreed)
- 87% of respondents agreed or strongly agreed that they enjoyed the chance to pick a concentration (ASD/ESEA) and courses for their degree program. (5% expressed no opinion, 8% disagreed or strongly disagreed)
- 76% of respondents disagreed or strongly disagreed that they wished they had enrolled in a program that had told them what courses to take. (11% expressed no opinion, 13% agreed or strongly agreed)
- 40% of respondents agreed or strongly agreed that people with a more focused undergraduate major are able to make better progress in their professions. (37% expressed no opinion, 23% disagreed or strongly disagreed)

Program Size

The majority of students and alum said they felt the program was small enough that they didn't "slip between the cracks", and a slight majority agreed the program could grow without losing that character.

- 79% of respondents disagreed or strongly disagreed that there were so many students in NRES that they felt like they fell through the cracks. (5% expressed no opinion, 16% disagreed or strongly disagreed)

- 60% of respondents agreed or strongly agreed that the NRES program could grow without losing a sense of connectedness. (22% expressed no opinion, 18% disagreed or strongly disagreed)

Diversity, Equity, & Inclusion

A slight majority of students and alum indicated they would like to see more DEI in the NRES program, in the students, faculty, and coursework. A large majority said they would be more likely to engage in environmental issues that connected with their background.

- 52% of respondents agreed or strongly agreed that they wished the students in the NRES program were more diverse. (30% expressed no opinion, 18% disagreed or strongly disagreed)
- 43% of respondents agreed or strongly agreed that they wished the faculty in the NRES program were more diverse. (39% expressed no opinion, 18% disagreed or strongly disagreed)
- 52% of respondents agreed or strongly agreed that NRES should add coursework to introduce topics around diversity, equity, and inclusion (DEI). (30% expressed no opinion, 18% disagreed or strongly disagreed)
- 52% of respondents agreed or strongly agreed that DEI should be fully integrated into NRES curriculum. (27% expressed no opinion, 21% disagreed or strongly disagreed)
- 52% of respondents agreed or strongly agreed that when they go to environmentally-related meetings or events, they find a diverse group of people engaged. (23% expressed no opinion, 25% disagreed or strongly disagreed)
- 68% of respondents agreed or strongly agreed that they are more likely to engage in environmental issues that connect with their life story. (18% expressed no opinion, 14% disagreed)

Open-ended questions:

When asked why they joined the NRES program, most responses fell into one of three generalizations: that the program aligned with their future career goals, that it was a good fit for their personal interests or history, or that it was a subject they were already passionate about. Less common responses included an appreciation of the interdisciplinary nature of the program, the flexibility of the coursework, the rigorousness of the coursework, the ability for the student to be able to make a difference in the world, and encouragement to join from an NRES faculty member.

When asked what they would change about the NRES program if they could, the responses were much more diverse. Below is a summary of those answers, with repeated themes being indicated by the multiplier at the end:

- Wouldn't change anything. (x5)
- More/better communication between the advisors and students. (x4)
- Greater transparency about coursework, options, and emphasis areas. (x3)
- More help transitioning to a Masters program. (x3)
- More networking and/or team-building events. (x3)
- Curriculum was too broad, not focused enough. (x2)

- Wishes summer camp was optional for those who are choosing a less outdoorsy career path
- Greater exposure to potential career paths.
- Greater emphasis on energy and emissions. (x2)
- Greater emphasis on environmental health & safety. (x2)
- Greater emphasis on science and math.
- Greater emphasis on social sciences, less emphasis on hard sciences. (x2)
- Greater emphasis on research.
- Greater emphasis on wildlife.
- Greater emphasis on sustainability.
- Greater emphasis on DEI.
- Greater emphasis on environmental science instead of natural resources.
- Greater emphasis on software used in NRES professions.
- Greater emphasis on forestry.
- Better marketing for the program within the College of Ag.
- Better marketing for the program to rural Kentuckians.
- A more global approach (less focus on Kentucky within curriculum) (x2)
- Capstone would be better as smaller group projects with more faculty direction instead of one large class project.
- More flexibility on scheduling summer camp and internships for transfer/non-trad students.
- More substitution options for introductory courses/more flexibility. (x2)
- Pandemic response was handled poorly with scheduling summer camps and internships.
- Too many courses had redundant/overlapping material
- Internship requirement should be free.
- Get rid of the “weed-out” classes where it’s normal to have a failing grade.
- Summer camp should be less expensive.
- More flexibility in when classes are scheduled – too many course times overlap.

Summary

A total of 57 current and former students from the NRES program responded to the survey; since there were no significant differences between the two groups (independent samples *t* test), we considered their responses *en toto*. Respondents were very favorable about the benefit of the NRES program to their professional journeys. They appreciated the breadth of the program; however, support for further education was substantial. A five-year mechanism to obtain both this B.S. and a related M.S. was attractive to a slight majority. Both the program’s culture (including advising) and its focus on hands-on experiences (*vis-à-vis* field camps, internship, research projects, and team-based fieldwork) were highly valued. Support for program growth was reasonably high. Regarding DEI initiatives, respondents were moderately favorable to the suggested frameworks. Notably, roughly 2/3 indicated that they are more likely to engage with natural resource issues that connect with their life stories. One way to read the difference between this response and other DEI items could be that respondents were unaware that diverse students might be drawn to different natural resource issues than majority students. Open-ended responses to a prompt about possible program enhancements yielded an array of valuable

suggestions; perhaps, the most consistent themes appeared to relate to improved communications and greater breadth of offerings, including field-specific trainings.

We suggest that the survey responses support: i) moderate program growth (provided the program culture can be maintained); ii) that planned DEI initiatives will require ongoing communications efforts to all students; and iii) development of linked B.S.-to-M.S. “five-year” configurations.

NRES-Associated Faculty and Staff

The NRES B.S. degree program is interdisciplinary in nature, with faculty derived from four departments within the College of Agriculture, Food, and Environment [Agricultural Economics (AEC), Forestry and Natural Resources (FNR), Landscape Architecture (LA), and Plant and Soil Sciences (PSS)] and two departments in the College of Arts & Sciences [Geography (GEO) and Earth and Environmental Sciences (EES)]. The NRES steering committee (SC) is a combination of faculty and staff who oversee all aspects of the program including developing and delivering curriculum, advising students, and program promotion. The membership of the NRES SC is currently made up of the NRES SC Chair (currently Chris Matocha, PSS, the DUS (currently Larry Grabau, also of PSS), and 10 additional members including an alum (see detailed roster, this report, page 2).

There have been significant changes in the composition of NRES-affiliated faculty and staff. Mary Arthur served as SC chair for more than 10 years and stepped down Dec 31, 2019 (she remains engaged in teaching and advising with NRES). Brian Lee (LA) stepped down as DUS as of Sept 30, 2019, after having been promoted to Associate Dean of Faculty Resources, Planning and Assessment (a college-level position). Larry Grabau stepped in as DUS on June 1, 2020. Most of the faculty/staff on the SC also teach one or more of the major course requirements and advise students. Additional faculty teach key courses for the NRES program, but do not serve as SC members or academic advisors for NRES students. Faculty who do not teach NRES courses nor serve on the NRES SC advise students (Mike Lacki and John Cox, FNR; Mark Coyne, PSS). The academic coordinator (AC), Adia Sovie, teaches a core course and has been assigned to handle transition advising (new first-year students as well as incoming transfer students) to deal with the logistics of growing enrollment. Jack Schieffer (AEC) provides not only instruction for multiple policy-oriented courses in the program, but also coordinates our highly valued experiential courses (NRE 395, Research, and NRE 399, Internship). Kevin Yeager (EES) ended his term on the Steering Committee and was replaced by Dave Moecher to represent that department. Since the last program review, an alum, Sandra Broadus (Class of 2012, UK Alternative Transportation), was added to the SC as was Lynn Phillips from Geography. All in all, the NRES SC members work together in a strongly collaborative fashion.

Faculty participation in NRES is voluntary and done largely out of personal commitment to the program’s mission, vision, and goals, with the exception of two faculty members and one lecturer who have job descriptions tied directly to NRES (Dave McNear, PSS; Chris Barton, FNR; Jack Schieffer, AEC). Brian Lee’s expertise in GIS allowed him to teach one of the core courses, NRE/LA 355, and advise students who select Geospatial analysis as their analytical skill development area. We are currently trying to add someone on the SC with Geospatial experience and are working with LA Chair (Ned Crankshaw) to plan for a way forward for this

critical area. Adina Cox (LA post-doctoral scholar) has provided instruction in the interim, and we are hoping that the LA Department will be able to permanently fill the vacant geospatial analysis position. During the last program review, there was concern of tension between commitments to NRES faculties' home departments and involvement in NRES. The development of MOUs between affiliated CAFE departments (AEC, FNR, LA, and PSS) since the last review is a strong step towards continued collaboration (please see these letters as Appendix 1). In a recent NRES SC meeting with the affiliated chairs, it was mentioned that the new budget configurations at the University level (in response to the COVID-19 pandemic) have strained departmental budgets. Therefore, maintaining and/or increasing faculty involvement in the program will remain a challenge, especially if new budget realities lead to increased guarding of faculty time by participating departments.

Faculty Instruction Capacity and Quality

Faculty directing courses required of all of our NRES majors are shown in Table 1 below. The majority of these faculty are in CAFE; Ratajeski and Fryar (both of EES) and Sandmeyer (of Philosophy) are located in the College of Arts & Sciences. Detailed documentation for these faculty is included in the following Appendices: i) Appendix 10 includes CVs for the CAFE teaching faculty from this list, ii) Appendix 11 includes degrees held by the CAFE teaching faculty, and iii) Appendix 12 shows “Teacher-Course Evaluations” (TCEs) for this same set of our instructional team. The paragraph below summarizes the information available from each of these three sets of measurements. We note that, in general, this instructional team has been relatively stable, with most instructors having directed their listed courses for several consecutive years. Exceptions are for NRE 355 (Dr. Adina Cox was recently listed to cover that essential course as part of her postdoctoral duties—in the light of Dr. Brian Lee’s promotion) and for NRE 201/320 (Dr. Adia Sovie was recently hired as AC, replacing our first NRES program AC—Geri Philpott--in that capacity).

Table 1. Faculty currently directing key courses in the NRES program.

Nat Sci course	Teacher(s)	Soc Sci course	Teachers(s)	Core course	Teacher(s)
EES 220	Ratajeski	PHI 336	Sandmeyer	NRE 201	Sovie
FOR 340	Arthur	NRE 381	Schieffer	NRE 320	Barton/Sovie; Paratley
FOR 325	Paratley	NRE 355	Adina Cox	NRE 395/399/400	Schieffer, Grabau
PLS 366	Matocha/McNear	AEC 326	Gorton/Schieffer	NRE 471	Schieffer
FOR 435	John Cox	AEC 445G	Buck/Schieffer		
FOR 460/EES 385	Barton/Fryar				

Professional CVs for our program’s teaching faculty (Appendix 10) illustrate the breadth and depth of their skill sets; they are well qualified to direct students’ learning in their focus areas. Among others involved in our core courses (required of all NRES students), we note Arthur’s

strengths in forest ecology, Barton's in forested watersheds, J. Cox's in mammalogy, Price's in herpetology, Schieffer's and Buck's in natural resource economics, and Paratley's in economic botany (with a naturalist's bent). Further, we have reached out to EES faculty for instructional support in introductory geology (Ratajeski) and groundwater hydrology (Fryar) as well as Philosophy's Sandmeyer for a broadly crafted review of environmental philosophies. In addition, our students benefit from the instructional environments constructed by numerous other faculty, as those students choose analytical skill development and environmental systems emphasis areas upon which to focus. Camp courses engage (in non-COVID-19 times) numerous other NRES specialists in their chosen arena—whether in Robinson Forest or in Costa Rica. In addition, numerous faculty have participated in our specially designed NRE 395 (research) and NRE 399 (internship) courses, serving in essential mentoring roles for these individually chosen and developed experiences. (Please refer to sections on “Research” and “Extension/Outreach” for more information on those aspects of these student-specific experiences.)

The listing of educational attainments of NRES program faculty (Appendix 11) further establishes their preparation to develop supportive, yet challenging learning environments, along with their well-documented capacity to assess the quality of NRES students' work (with an eye to helping students improve their skills for their professional journeys). Finally, Appendix 12 shows the consistently high quality of courses and instruction offered by the NRES faculty (questions 20[course quality] and 21[teaching quality] on the University of Kentucky's TCE form). Note that Appendix 12 shows all of the TCEs for all each listed faculty member's instruction over the past ten years; thus, some courses (for example, FOR prefixed courses directed by FNR faculty) are not necessarily taken regularly by NRES students. Note that, starting from the fall semester of 2016, the scoring for both listed measures (course and teaching quality) was adjusted from a 4.0 scale (4 being the most favorable rating of teachers by students) to a 5.0 scale. Across the presented years and scaling change, NRES faculty have been consistently well-rated by NRES students for the quality of their courses and their instruction.

Delivery of Instruction

Undoubtedly, the most significant adjustment in the delivery of NRES program instruction has been as of March 2020—with the University of Kentucky's move to online instruction in response to the COVID-19 pandemic. All spring 2020 NRES courses moved, in a period of days, from in-person to online instruction. Given the experiential, hands-on nature of the instructional environments around which the NRES program has been designed, this was a particular challenge. Faculty have taken extraordinary measures (e.g., video-taping field activities to share with students via Zoom) in order to make the ongoing student experience as positive as possible. These accommodations have allowed students to continue to progress through the program, during the ongoing pandemic. We hope that we are learning some lessons about the creation of high-quality instructional environments in online settings; we long for the return of fully in-person instruction.

The courses most significantly impacted by the pandemic have been our summer camp (NRE 320) and our individual experience courses (NRE 395, research and NRE 399, internship). In the summer of 2020, the Robinson Forest version of NRE 320 was delivered virtually to four students with an urgent need to complete this course in order to graduate on a timely basis (the

program is, of course, grateful to Drs. Barton and Sovie for their efforts to make that camp work as well as it did). That same summer, the Costa Rican version of NRE 320 was cancelled, due to safety concerns about international travel. For the summer of 2021, CAFE has approved an in-person plan for safely delivering NRE 320 in Robinson Forest. Thus, we are hopeful that this essential course can be provided on an in-person basis for NRES students. We also have reason to hope that our Costa Rican version of NRE 320 may come to fruition in the summer of 2021; UK's Education Abroad (EA) office has given Dr. Paratley a conditional go-ahead to offer this experience in-person this summer.

Unsurprisingly, many NRE 395 and 399 experiences planned during the summer of 2020 were cancelled, disrupted or drastically modified by the pandemic's presence. Both students and faculty have worked diligently to provide appropriate experiences for students, as this requirement is essential to program goals for NRES students. Spring 2021 semester has shown a rebound in the number of students engaged in NRE 395/399 experiences; students, faculty and institutions have found reasonably safe ways to engage in such experiences.

Perhaps the primary, non-pandemic innovation in instructional delivery has been the adjustment in the program's Graduation Composition and Communications Requirement (GCCR). The GCCR (a university requirement) anticipates that most majors will satisfy this requirement (involving written, oral and visual communications) through program-embedded mechanisms. Indeed, the NRES program has used an embedded mechanism (even during prior years when the Graduation Writing Requirement—GWR—was the order of the day; during that time, NRE 201 included the completion of the GWR). Until recently, NRE 395/399 students enrolled in three-credit versions of those courses, completing their GCCR as part of those courses (working with the faculty member advising them in the experience). Our recent innovation has been to create a new two-credit, online “coordination” course—NRE 400. This course, coordinated by Dr. Schieffer, serves to bring together all students completing their visual/oral (poster) and writing (white paper) with a common set of expectations, including rubrics specific to both those communication modes. The culmination of the NRE 400 course, for each student, is their poster presentation at the NRES Forum. Unsurprisingly, the fall 2020 iteration of the NRES Forum was held virtually; however, the student presentations were well-done and well-received (in spite of the constraints). We are, of course, to return to an in-person NRES Forum format as soon as such a format is safe. The NRES Forum has provided an exceptionally positive opportunity for NRES students to present their work to stakeholders, NRES faculty, and fellow NRES students. A key design feature of the NRES Forum has been the requirement that our introductory students (in NRE 201) engage in the event. That has been a truly positive step, as our early-program students have the chance to “check-out” numerous experience types. Of course, this has been valuable in helping students seek their own experiences in subsequent semesters.

Part time instructors (PTIs) have been essential to the NRES program. A long-term role was with NRE 355 (a required course for NRES students); a succession of highly trained PTIs capably delivered this course for many years during Fall semesters (with a modest stipend), while Brian Lee delivered the course during Spring semesters. Once Dr. Lee moved into CAFE administration, Ned Crankshaw of LA arranged for a postdoctoral scholar (Adina Cox) in their department to add that course (as well as the higher level, optional GIS course—NRE 556) to her duty list. As noted elsewhere, we are urging CAFE to fill the vacant geospatial analysis position;

among other benefits, that position would cover the LA/NRE 355 needs for both programs. Unfortunately, the loss of summer tuition revenue from the budgetary adjustments could force the NRES program to make difficult decisions about course requirements (dropping this GIS course requirement, dropping PTI support for the two non-required NRE courses discussed below, and/or providing such courses on a less frequent basis).

Two key NRE courses have been staffed by PTIs: NRE 360, Environmental Communications (by Angela Poe) and NRE 365, Environmental Education (by Laurie Thomas). The NRE 360 course is offered in fall semesters; the NRE 365 course in spring terms. These courses have provided strong support for NRES students interested in these aspects of NRES-related professional outcomes. (Students in the Agricultural Education Program have also self-selected into the NRE 365 course.) Given the ongoing interest of NRES students in the extension/outreach areas for their professional journeys (see the “Extension/Outreach” section of this self-study), we are eager to continue our commitment to these courses. Further, we have been able to bring aboard Jennifer Hubbard-Sanchez as a co-teacher of NRE 365 (alongside Laurie Thomas, at her suggestion) for the spring of 2021. Hubbard-Sanchez is a former Extension Specialist with Kentucky State University (KSU), current Chair of the Kentucky Association for Environmental Education (KAEE), and currently works for the Lexington-Fayette Urban County Government (LFUCG) as a superintendent in Parks and Recreation. Hubbard-Sanchez’s PTI role is in line with our renewed focus on bringing aboard a more diversified and inclusive instructional team.

William (Bill) Gorton directs the environmental law course (AEC 326) required of our students once per year (Jack Schieffer, who has not only a Ph.D. but also his J.D.) fills this role the other semester each year. The AEC program provides the funds to support this PTI role for Gorton (whose son Kris, incidentally, is a graduate of the NRES program). Thus, while this particular PTI support is not drawn from the modest (and declining) NRES support base, this important PTI role could be threatened by financial challenges faced by the AEC program as a whole.

Learning Outcomes Assessment

Under the leadership of Dave McNear, the NRES program developed a comprehensive set of program-level student learning outcomes (PSLO) for the program. Details of that assessment plan are shown in Appendices 6 (PSLO form for Office of Strategic Planning and Institutional Effectiveness, OSPIE), 7 (full background of our assessment plan), and 8 (draft rubrics intended for use in our upcoming round of program-level evaluation in May and June of 2021). Thus, the main work we have been focused on over the past two years has been in a comprehensive redesign of our PSLO assessment. The four primary student learning outcomes are as follows:

#1: Students will <u>demonstrate proper data collection methods and analysis techniques</u> in field and laboratory settings to solve fundamental and quantitative problems involving contemporary and emerging, local, regional and/or global natural resource and environmental issues.

#2: Students will be able to <u>integrate principles of human systems</u> such as those found in history, law, public policy, ethics, and economics, to find solutions for contemporary and emerging, local, regional and/or global natural resource and environmental issues.
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#3: Students will demonstrate their ability to draw conclusions and make recommendations based on an interdisciplinary understanding of contemporary and emerging, local, regional and/or global natural and human systems principles and perspectives.

#4: **(GCCR)** Students will demonstrate their ability to function as part of a multidisciplinary team and be able to effectively communicate natural resource and environmental issues in written, oral, and visual formats to professionals and community stakeholders.

The program has, in the past, evaluated these PSLOs in less-than-precise ways. For example, by asking outside stakeholders (present at the formal presentation of our senior capstone course each year) to evaluate each graduating cohort on the basis of this comprehensive, end-of-program “team of teams” effort. Our new approach to PSLO assessment has identified specific courses in which specific student learning outcomes are addressed. Student work (artifacts, from an assessment context) from those courses is collected in order to improve our assessment efforts. We have provided the above-mentioned outside evaluators with a reasonably well-designed rubric, addressing each of the PSLOs in multiple ways, along with requesting open-ended comments. While we intend to continue to invoke this sort of evaluation, it is not sensitive enough to determine the extent to which each of our program’s students has achieved our hoped-for levels of mastery of each of the PSLOs. Our new assessment plan identifies specific assignments within specific courses as artifacts of student learning for each of the four PSLOs. Those assignments are now collected each semester, stripped of student identifiers, and will be subjected later this spring to independent review (not including the course instructor from which they were drawn, hopefully including a mix of NRES faculty and outside evaluators). We believe that this new assessment plan will help us better monitor student learning and to make necessary enhancements to our learning and teaching environments over time.

Research and Outreach/Extension Experiences for Students

Individual learning experiences provide NRES majors the opportunity to gain research and outreach/extension experiences. Students may choose between NRE 395 (research-focused) or NRE 399 (internship-focused). In the fall, all NRES students who are taking NRE 395 or NRE 399 display their semesters’ efforts at a Fall Forum. This is an open house in which all students are in person and available to provide detailed information on their work as observers/interested parties move through to inquire about each project. Appendix 9 includes the most recent five years of the NRES Fall Forum’s program pages⁶ and enumerates NRES’ student presentations, and students’ engagement in research and outreach/extension training activities. Over the five years analyzed, 22 student experience projects (or 19% of the total 117 students tallied) were primarily focused on research. Contributing faculty included Price (FNR, 7 students), Arthur, Barton, Cox, and Stringer (also of FNR), Coyne, Matocha, McNear, and Shephard (PLS), Rieske-Kinney (Entomology), Yeager, (EES), Sovie (NRES), Bell (Sociology), Crowley (Biology), and Usher (Educational Psychology). Effectiveness of the experience program was

⁶ While we invoke these NRES Fall Fora programs here to analyze the research and extension/outreach opportunities enjoyed by NRES students, they also provide a window into the depth and diversity of our student’s experiences! Indeed, in some ways, this material might provide one of the very best “pictures” of what the NRES program is attempting to build into the lives of these students as they progress on their academic and professional journeys.

primarily assessed through the evaluations of student poster presentations at these annual fora. Evaluators included NRES program faculty, outside stakeholders, and fellow NRES students. Direct feedback (oral, in-person or on Zoom) to student presenters is provided by both the outside evaluators and NRES program faculty. More recently, the new course (NRE 400) directs students and their faculty mentors to prepare their presentations for these fora. Notably, that course also includes a substantive white paper requirement; both the posters and the white papers are subject to uniform rubrics and require a draft/re-draft process between the student and their faculty mentor.

Approximately 31 out of 177 (26.5%) of our students focused on environmental education. Sites for environmental educational engagement include, among other locales, Salato Wildlife Education Center, Raven Run Nature Sanctuary, the Urban Forest Initiative, the Forest Health Initiative, the Food Connection, several international community partners, and other environmental education internships. Some activities were faculty-directed (that is, the student was able to experience environmental education through the ongoing work of CAFE faculty members with an extension appointment (Crocker, Brad Lee, Barton). Presentations and evaluations are noted in the section above. We are also pleased to note that a good number of our students are now able to participate in the new undergraduate certificate in Urban and Community Forestry. That alternative gives them a chance to build their scientific knowledge in this arena, as well as augmenting their skill sets in related outreach activities.

Diversity, Equity, and Inclusion in the NRES Program: Current Status and Recommendations for Improvement

Enhancing diversity, equity, and inclusion (DEI) in undergraduate education experiences is beneficial for current and future students. It adds diverse perspectives on NRES issues and topics and improves the attainment of learning outcomes for all students. As of July 2020, the NRES undergraduate program included 113 students. Of the 113 students, 89.4% (101 individuals) were white (Non-Hispanic), 3.5% (4 individuals) were Hispanic, 2.7% (3 individuals) were from multiple racial backgrounds, 0.9% (1 individual) were American Indian or Alaskan Native, and 0.9% (1 individual) were Black (Non-Hispanic). Three individuals did not report their racial background. This lack of diversity extends to the NRES Steering Committee (NRES SC) as well, all 12 members of the NRES SC were white (Non-Hispanic). Additionally, 9 out of 12 NRES SC members identify as male, and 3 NRES SC members identify as female. Further, all individuals in leadership positions in the NRES program are white (Non-Hispanic). Other demographics are unknown, including gender identity, disability status, socioeconomic status, and LGBTQ+ representation.

The NRES program is committed to increasing the diversity, equity, and inclusion (DEI) of its student body, steering committee, leadership, and program curriculum. In order to improve DEI at all levels of the NRES program we will implement strategies at several levels of the program. We seek input from the review committee about the efficacy of the below-listed approaches to accomplish these goals.

1. Increasing Recruitment of Underrepresented Minority Students

The NRES student population is not reflective of the demographics across the university of Kentucky. To address this, we plan to establish recruitment activities and events at minority-serving high schools across Kentucky. We will target high schools in Louisville, Lexington, and Northern Kentucky (e.g., Covington, KY). The academic coordinator will travel to these schools to present the NRES program and participate in college recruitment events. We will measure success by comparing the number of students from racial and ethnic backgrounds other than white in future years to our base year (e.g., 2020).

2. Decolonizing NRES courses and curriculum

NRES has been dominated by white, straight, males; as such, most courses emphasize the accomplishments of individuals with this identity. “Decolonizing” curriculum involves the de-emphasis of the accomplishments or research of white, straight males, and increases the inclusion of the work and accomplishments of researchers and scholars from diverse backgrounds. Decolonizing curriculum not only promotes the work of diverse scientists, but also demonstrates that scientists have diverse identities outside of the classical archetype. During the summer of 2022, all instructors of NRES core curriculum courses will be asked to participate in decolonization activities. Each instructor will be asked to examine each component of their courses (e.g., lectures, assignments, laboratory exercises, and case studies), and to identify potential opportunities to highlight research performed by scientists that are not white, male, or straight. Success will be measured by the number of instructors who participate. Additionally, we will measure success by the number of times an instructor reports utilizing the scholarship of an individual who is not white, straight, or male in respective course syllabi/readings/modules.

3. Supporting BIPOC Faculty

There is a significant need to increase participation of faculty from backgrounds other than white, straight, and male in NRES instruction. University of Kentucky faculty members who are Black, Indigenous and/or People of Color (BIPOC) offer courses that are relevant for NRES students and also meet NRES curriculum requirements. The NRES SC will seek to diversify student experiences by suggesting they enroll in courses offered by BIPOC faculty members. NRES academic advisors will be encouraged to recommend courses to their NRES advisees that are offered by BIPOC faculty members. During biannual NRES academic advisor meetings, the NRES academic coordinator will provide the NRES academic advisors a list of NRES curriculum-approved courses taught by BIPOC faculty. When appropriate, NRES academic advisors will be encouraged to recommend these courses to their advisees. We will measure success in increasing NRES student enrollment in courses offered by BIPOC faculty members by asking each advisor to determine how many of their advisees enrolled in the identified courses and reporting these numbers to the academic coordinator. The academic coordinator will report the total number of NRES students enrolled in these courses, and we will monitor enrollment for the next three academic years.

4. Increasing representation in NRES SC and Leadership Roles

Currently, there is limited participation of individuals on the NRES Steering Committee that are not straight, white males. Additionally, leadership roles in the NRES program are also filled by white individuals. The lack of diversity in the NRES SC and leadership demonstrates that the program does not experience diverse participation in NRES. Incorporating faculty, NRES SC, and advisers that identify as Black, Indigenous, People of Color, LGBTQ+, and/or female will model that the NRES program is for individuals from any background. Our goal over the next five years is to reach gender equity on the NRES SC (i.e., equal participation of women and men) by identifying and successfully recruiting more women to serve on the SC. Further, over the next five years we will recruit BIPOC faculty members to participate on the NRES SC. To avoid tokenism and provide credit for work with the NRES SC, we will encourage department heads to include distribution of effort (DOE) for instruction for all new individuals. Success will initially be measured by the number of new individuals from diverse backgrounds that are recruited to serve on the NRES SC and in leadership roles. A more powerful measure of success will be based on NRES student perception of the NRES SC and leadership; we will include in the exit survey a question asking specifically if graduating NRES students perceive diverse representation and diverse backgrounds among leadership. We will compare student perceptions between the year 1 and year 5 of our recruitment campaign to determine success.

5. *Offering environmental racism/justice course*

The NRES program currently does not offer courses that acknowledge the intersection of racism, socioeconomics, environmental management, and colonial power structures of historical land legacies. The absence of this course limits the ability of NRES students to interpret how racism and racial issues impact NRES management in both rural and urban settings. In the future, we aim to offer an environmental racism/justice course as an NRE 300 General Topics course. We will offer this course for three years (underdetermined frequency), and then will initiate the process to make this course a permanently scheduled course offering. We will measure success by numbers who enroll in the three years the course is offered as NRE 300. If student enrollment is greater than 10 students per course offering, we will consider this a success.

Required Resources for DEI Initiatives

To achieve these objectives, the NRES program needs additional financial resources to implement those actions. Resources such as travel funds for the academic coordinator to attend high school recruitment events across KY, and monies to develop and implement an improved NRES graduate exit survey are needed. Additional resources include incentives to encourage faculty participation in the NRES SC and leadership roles. Funds are also needed to hire a part-time lecturer to offer an environmental racism/justice course. With the resources and implementing these strategies, we will be able to establish and solidify our commitment to diversity, equity, and inclusion in the NRES program.

Facilities and Budget

Facilities

Note that the NRES program has only one program-dedicated facility (the office of our Academic Coordinator). To provide the review committee with a better view of our program's facility resources, a link to a video tour will be sent to the remote committee by email in advance of the remote listening sessions. The virtual tour will include discussion of classrooms, office spaces, field sites, and study abroad locations. Briefly, we meet our needs for student learning spaces by utilizing college-level classrooms, supplemented with access to Robinson Forest and Costa Rica as summer camp locations, and filled out by student experiences through either NRE 399 (internships, a wide variety of providers) or NRE 395 (research projects, most commonly with UK faculty within or beyond the NRES program per se). These additional points of access, however, create additional financial burdens for our students (above-and-beyond their regular residential or out-of-state tuition, room and board, and the like). Under the previous NRES SC Chair's (Dr. Mary Arthur) leadership, we initiated a plan to "turn around" summer school tuition returns from the university to provide scholarships for these self-same programs for students with documented financial need. Unfortunately, summer school tuition returns will no longer be shared by the university with programs, nearly eliminating our capacity to provide scholarships for students with need. This is particularly problematic at this juncture in the program's life, as we are eagerly pressing forward toward engaging more diverse students in coming academic years. As some such students face financial stresses (along with other disincentives to enter NRES), the elimination of our capacity to provide scholarships for these essential experiences for our students—a hallmark of our program—could hamstring our capacity to engage persons from lower income categories, including BIPOC students. Education Abroad (EA) does provide scholarships to support University of Kentucky students in such coursework, and some EA scholarship funds are explicitly targeted for diverse students.

Budget

The NRES program has had three separate budget accounts to support this program:

- i) the NRES Support Account (funded by CAFE from state instructional funds),
- ii) the NRES Course Fee Account (for the collection and disbursement of supplementary (beyond standard tuition) course-specific course fees in the NRES program), and
- iii) the NRES Summer School Account (which has, in the past, provided for returning a significant portion—40%—of tuition for courses delivered during the summer semester to the program providing that instruction).

Details of each of these three accounts for the past six fiscal years are shown in Appendix 15 (produced by Deb Ramey, Scholarship and Financial Manager, Center for Student Success, College of Agriculture, Food and Environment). Note that Deb manages financials for the NRES program; that arrangement places financial accountability for this program centrally (with the College) rather than with any of the participating departments.

Primary program support, including for the full-time AC role, comes from the NRES Support Account. Over the six-year time frame, this account has averaged \$70.7K/fiscal year. Besides

covering the essential AC role, the most important additional function of this account has been to provide support for part-time instruction (see details in faculty section of this report).

In both design and practice, the NRES Course Fee Account utilizes course-specific fees charged of students enrolled in those courses to cover course costs above-and-beyond tuition. Over the past six years, average course fee “income” to this account has averaged \$12.0K/fiscal year. The NRES program’s largest single course fee is for our three-credit NRE 320. This camp-based, field experience program currently has a per-student course fee of \$893. Other course fees are primarily set up to support course-related field trips (for example, in our introductory course, NRE 201, and in our senior capstone course, NRE 471). Importantly, these course fees are fully committed to support course-specific expenses, and thus, do not generate an ongoing source of flexible-use funds for the program.

The NRES Summer School Account has averaged \$14.0K/fiscal year (over the review period). These funds have primarily been directed toward the support of summer camp experiences (NRE 320) as scholarships for students with identified financial needs. Typically, these funds have been returned to originating instructional units in the fiscal year following a summer’s courses. We have also made use of these funds as the primary source of support for the NRES program’s one or two student employees. Unfortunately, the crush of the pandemic’s strain on the University of Kentucky’s budget has resulted in the elimination of this return of summer tuition. This clearly will handicap our efforts to provide scholarship support for students of need for our required summer camp courses. Further, the aggregate student need for such scholarships could rise—assuming that we are successful in drawing more BIPOC students to the program. Conversely, this sudden disappearance of a dependable source of scholarship support could serve to inhibit the entrance or retention of students with financial concerns from the program.⁷ Another possible outcome of this significant budgetary constraint on the NRES program is that the leadership may have to consider forgoing PTI instruction for important NRES-related courses in order to provide students-of-need with summer school scholarships.

⁷ Note that student financial aid is much more difficult to obtain, particularly from federal sources, for summer school enrollments. Further, students under financial stress often supplement their income through paid summer work; in this program (for good instructional reasons, of course), we not only ask students to forgo summer income but also to pay summer tuition and course fees.

List of Appendices

- Appendix 1. Memoranda of Understanding from collaborating departments, CAFE.
- Appendix 2. EST-to-NRES transfer table.
- Appendix 3. Brief view of NRES program courses and experiential learning opportunities.
- Appendix 4. Flexible four-year NRES curricular plan, semester-by-semester.
- Appendix 5. Survey instrument, NRES alums and current students.
- Appendix 6. Program-level student learning outcomes assessment, OSPIE form
- Appendix 7. Program-level student learning outcomes assessment, full context
- Appendix 8. Program-level student learning outcomes assessment, rubrics
- Appendix 9. NRES fall fora programs, 2015-2020
- Appendix 10. CVs for NRES program faculty directing core courses
- Appendix 11. Educational attainments, core NRES program faculty
- Appendix 12. Teacher/course evaluations, core NRES courses
- Appendix 13. Position description, NRES AC
- Appendix 14. Advising loads, NRES program, example from spring 2021
- Appendix 15. Six-year budget summary, NRES program.

MEMORANDUM OF UNDERSTANDING
between
THE UK DEPARTMENT OF FORESTRY AND NATURAL RESOURCES FACULTY
and
THE NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE UNDERGRADUATE DEGREE
PROGRAM STEERING COMMITTEE

This MOU establishes and describes the working relationship between the UK Department of Forestry and Natural Resources (FNR) and the interdisciplinary Natural Resources and Environmental Science (NRES) undergraduate B.S. degree program Steering Committee.

Background:

The University of Kentucky College of Agriculture, Food and Environment (CAFE) is structured as a set of independently-functioning departments, most of which deliver undergraduate programs and confer a Bachelor's degree in a discipline strongly aligned with the academic discipline of the department. There are also several undergraduate programs within the UK CAFE that are interdisciplinary and interdepartmental, requiring collaboration and cooperation between or among two or more departments, primarily through the sharing of faculty and staff resources, to effectively and efficiently develop, maintain, and deliver these programs. Within the UK CAFE there are several informal models for this collaborative arrangement, all of which rely on unwritten agreements between the Chair of the respective departments contributing to the program and the steering committee chair of the interdisciplinary program. This leaves interdisciplinary programs vulnerable to adverse effects of changes in department policy and decision making due to a number of factors including fluctuating budget models, budget and personnel constraints, changes in department focus, and changes in program and department leadership. Interdisciplinary programs are also hampered by not having direct representation at the administrative level, which further emphasizes the need to provide a formalized and written collaborative framework between contributing departments and interdisciplinary programs like NRES. Likewise departmental contributions to interdisciplinary programs need to be appropriately recognized by the College and taken into consideration in budgeting and resource allocation decisions.

The FNR department offers an undergraduate B.S. degree in Forestry and, along with several other departments, contributes faculty distribution of effort and resources (e.g., space, printing) to the interdisciplinary NRES undergraduate B.S. program. While the two degrees differ markedly in course requirements and program goals, there is overlap in required courses (some of which are taught by FNR faculty). In addition, elective courses for NRES students include a number of Forestry courses. Below is a description of the two programs:

B.S. Forestry

FNR offers one undergraduate B.S. degree in Forestry. The B.S. in Forestry is a professional undergraduate degree program accredited by the Society of American Foresters that trains students to work in the forestry field. The objectives of the required courses in the forestry curriculum are to educate and train students in the communication, managerial, scientific, processing, and administrative skills and principles related to the stewardship and utilization of renewable natural resources. The curriculum consists of UK Core requirements, pre-professional, professional, and specialty support components, which provide the skills and understanding to manage forest resources. Electives, chosen with the assistance of a faculty advisor, strengthen knowledge of basic principles in areas of special interest to students. As such, this curriculum prepares students for employment as professional foresters in private forest industries and organizations, consulting companies, and federal, state, county and urban forestry and natural resource agencies and programs. Graduates are also qualified to be research technicians in government, university, and private laboratories, or continue their studies in M.S. and Ph.D. programs.

B.S. Natural Resources and Environmental Sciences

The B.S. in Natural Resources and Environmental Science is designed to provide students with the knowledge and skills needed for a career in the rapidly growing fields of environmental science, natural resource management, and environmental policy. This curriculum provides students with exposure to a broad array of disciplines that are essential in approaching issues of natural resources, environmental quality, and environmental sustainability. All students in the program take a common core of major course requirements, which are designed to provide exposure to technical and socioeconomic dimensions of natural resource management and policy. In addition to the core requirements, all students must complete nine hours of course work in both an Analytical Skill Development Area (ASD) and an Environmental System Emphasis Area (ESEA). This allows students to match analytical skills to an area of particular interest in conservation biology, natural resource planning, environmental soil science, water resources, environmental education, forestry, wildlife management, agricultural sustainability, geological processes, or related areas. Courses for the ASD and ESEA are selected from a list of courses in each area, which are offered by multiple departments within UK CAFE and in other departments across the university. As part of the degree, students are required to complete an internship or an undergraduate research experience. Many graduates with a B.S. in NRES continue their studies in M.S. or Ph.D. programs or law school, while most begin careers as aspiring environmental professionals in both the public and private sector including jobs in environmental education, journalism, and work with nonprofit organizations with environmental concerns.

Purpose:

The purpose of this MOU is to articulate the ways in which NRES and FNR collaborate to create a positive learning environment that fosters undergraduate and graduate student development, strengthening both programs in the process, and supporting faculty who contribute to both programs. This MOU also makes explicit the contributions of the NRES program to the affiliated department (in this case FNR), and emphasizes the need for open communication between programs. In addition to supporting the goals of the FNR and the NRES program, this MOU strengthens CAFE's commitment to the educational portfolio in a natural resource and environmental sciences cluster of majors.

The purpose of this MOU will be accomplished by engaging in the following activities:

FNR will consult, and where appropriate and consistent with FNR goals, objectives, and capacity, collaborate with the NRES Steering Committee in:

- Faculty and lecturer hiring, and inclusion of NRES responsibilities as appropriate in position descriptions.
- Allocation of new and established faculty and lecturer efforts in support of NRES teaching, advising, and NRES Steering Committee membership.
- Development of Faculty Distribution of Effort agreements to insure that faculty efforts adequately reflect NRES engagement and when possible potential needs of the NRES program.
- Provide and/or assist in providing office and storage space and resources (e.g. printing)

FNR and NRES agree to:

- Develop course scheduling to facilitate student participation from both programs as well as instructional efficiency.
- Seek opportunities to share and facilitate access to equipment and supplies to improve instructional efficiency.
- Consider program and degree development to decrease the potential for competing or redundant programs.
- Share information about the programs to facilitate current and prospective students in finding the best fit for their undergraduate program and major.
- Be strong advocates for each other with CAFE administration, University, and extra-University interactions and partners.
- Explore and take advantage of shared degree and program marketing and recruiting opportunities and avoid, where possible, adverse effects to either program from independent marketing and recruitment efforts.


- Hold a formal meeting annually among the leaders of the two undergraduate programs, to include the FNR Department Chair, the NRES Steering Committee Chair, Directors of Undergraduate Studies of both programs, and the FNR Undergraduate Program Committee Chair, to foster communication and evaluate the effectiveness of the MOU and its provisions.
- Share appropriate job openings and job contacts with FNR and NRES students.

Funding:

There is no direct or concrete commitment of funds associated with this MOU. However, it is understood that sharing faculty and staff efforts with an inter-departmental program has both monetary and non-monetary costs and benefits for all parties involved.

Duration and Modification:


This MOU may be modified by mutual consent of the faculty of the Department of Forestry and Natural Resources and the Natural Resources and Environmental Science Steering Committee. Chairs, or appointed FNR and NRES representatives, in consultation with the CAFE dean and/or representative, will make reasoned attempts to reconcile conflicts to avoid unilateral dissolution of the MOU by either FNR or the NRES Steering Committee.



Dr. Jeffrey W. Stringer
Interim Chair
Department of Forestry and Natural Resources

9-15-17

Date

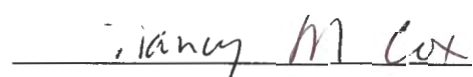


Dr. Mary Arthur
Chair
Natural Resources and Environmental Science Undergraduate Degree Program Steering Committee

9.15.17

Date

This MOU was established with the consent of:



Dr. Nancy Cox
Dean, College of Agriculture, Food and Environment

9.25.17

Date

MEMORANDUM OF UNDERSTANDING
between
THE UK DEPARTMENT OF AGRICULTURAL ECONOMICS FACULTY
and
THE NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE UNDERGRADUATE DEGREE
PROGRAM STEERING COMMITTEE

This MOU establishes and describes the working relationship between the UK Department of Agricultural Economics (AEC) and the interdisciplinary Natural Resources and Environmental Science (NRES) undergraduate B.S. degree program Steering Committee.

Background:

The University of Kentucky College of Agriculture, Food and Environment (CAFE) is structured as a set of independently-functioning departments, most of which deliver undergraduate programs and confer a Bachelor's degree in a discipline strongly aligned with the academic discipline of the department. There are also several undergraduate programs within the UK CAFE that are interdisciplinary and interdepartmental, requiring collaboration and cooperation between or among two or more departments, primarily through the sharing of faculty and staff resources, to effectively and efficiently develop, maintain, and deliver these programs. Within the UK CAFE there are several informal models for this collaborative arrangement, all of which rely on unwritten agreements between the Chair of the respective departments contributing to the program and the steering committee chair of the interdisciplinary program. This leaves interdisciplinary programs vulnerable to adverse effects of changes in department policy and decision making due to a number of factors including fluctuating budget models, budget and personnel constraints, changes in department focus, and changes in program and department leadership. Interdisciplinary programs are also hampered by not having direct representation at the administrative level, which further emphasizes the need to provide a formalized and written collaborative framework between contributing departments and interdisciplinary programs like NRES. Likewise departmental contributions to interdisciplinary programs need to be appropriately recognized by the College and taken into consideration in budgeting and resource allocation decisions.

The AEC department offers an undergraduate B.S. degree in Agricultural Economics and, along with several other departments, contributes faculty distribution of effort to the interdisciplinary NRES undergraduate B.S. program. While the two degrees differ markedly in course requirements and program goals, there is some overlap in required courses which are taught by

AEC faculty. In addition, elective courses for NRES students include several AEC courses. Below is a description of the NRES program:

B.S. Natural Resources and Environmental Sciences

The B.S. in Natural Resources and Environmental Science is designed to provide students with the knowledge and skills needed for a career in the rapidly growing fields of environmental science, natural resource management, and environmental policy. This curriculum provides students with exposure to a broad array of disciplines that are essential in approaching issues of natural resources, environmental quality, and environmental sustainability. All students in the program take a common core of major course requirements, which are designed to provide exposure to technical and socioeconomic dimensions of natural resource management and policy. In addition to the core requirements, all students must complete nine hours of course work in both an Analytical Skill Development Area (ASD) and an Environmental System Emphasis Area (ESEA). This allows students to match analytical skills to an area of particular interest in conservation biology, natural resource planning, environmental soil science, water resources, environmental education, forestry, wildlife management, agricultural sustainability, geological processes, or related areas. Courses for the ASD and ESEA are selected from a list of courses in each area, which are offered by multiple departments within UK CAFE and in other departments across the university. As part of the degree, students are required to complete an internship or an undergraduate research experience. Many graduates with a B.S. in NRES continue their studies in M.S. or Ph.D. programs or law school, while most begin careers as aspiring environmental professionals in both the public and private sector including jobs in environmental education, journalism, and work with nonprofit organizations with environmental concerns.

Purpose:

The purpose of this MOU is to articulate the ways in which NRES and AEC collaborate to create a positive learning environment that fosters undergraduate and graduate student development, strengthening both programs in the process, and supporting faculty who contribute to both programs. This MOU also makes explicit the contributions of the NRES program to the affiliated department (in this case AEC), and emphasizes the need for open communication between programs. In addition to supporting the goals of the AEC and the NRES programs, this MOU strengthens CAFE's commitment to the educational portfolio in a natural resource and environmental sciences cluster of majors.

The purpose of this MOU will be accomplished by engaging in the following activities:

AEC will consult, and where appropriate and consistent with AEC goals, objectives, and capacity, collaborate with the NRES Steering Committee in:

- Faculty and lecturer hiring, and inclusion of NRES responsibilities as appropriate in position descriptions.
- Allocation of new and established faculty and lecturer efforts in support of NRES teaching, advising, and NRES Steering Committee membership.
- Development of Faculty Distribution of Effort agreements to insure that faculty efforts adequately reflect NRES engagement and when possible potential needs of the NRES program.

AEC and NRES agree to:

- Develop course scheduling to facilitate student participation from both programs as well as instructional efficiency.
- Seek opportunities to share and facilitate access to equipment and supplies to improve instructional efficiency.
- Consider program and degree development to decrease the potential for competing or redundant programs.
- Share information about the programs to facilitate current and prospective students in finding the best fit for their undergraduate program and major.
- Be strong advocates for each other with CAFE administration, University, and extra-University interactions and partners.
- Explore and take advantage of shared degree and program marketing and recruiting opportunities and avoid, where possible, adverse effects to either program from independent marketing and recruitment efforts.
- Hold a formal meeting annually among the leaders of the two undergraduate programs, to include the AEC Department Chair, the NRES Steering Committee Chair, and Directors of Undergraduate Studies of both programs, to foster communication and evaluate the effectiveness of the MOU and its provisions.

Funding:

There is no direct or concrete commitment of funds associated with this MOU. However, it is understood that sharing faculty and staff efforts with an inter-departmental program has both monetary and non-monetary costs and benefits for all parties involved.

Duration and Modification:

This MOU may be modified by mutual consent of the faculty of the Department of Agricultural Economics and the Natural Resources and Environmental Science Steering Committee. Chairs, or appointed AEC and NRES representatives, in consultation with the CAFE dean and/or representative, will make reasoned attempts to reconcile conflicts to avoid unilateral dissolution of the MOU by either AEC or the NRES Steering Committee.

**Leigh
Maynard**

Digitally signed by Leigh Maynard
DN: cn=Leigh Maynard, o=University
of Kentucky, ou=Agricultural
Economics,
email=leigh.maynard@uky.edu, c=US
Date: 2017.12.13.15:36:44 -05'00'

12/13/17

Dr. Leigh Maynard

Date

Chair

Department of Agricultural Economics



12-19-17

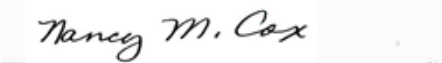
Dr. Mary Arthur

Date

Chair

Natural Resources and Environmental Science Undergraduate Degree Program Steering Committee

This MOU was established with the consent of:



12-21/17

Dr. Nancy Cox

Date

Dean, College of Agriculture, Food and Environment

MEMORANDUM OF UNDERSTANDING
between
THE UK DEPARTMENT OF LANDSCAPE ARCHITECTURE FACULTY
and
THE NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE UNDERGRADUATE DEGREE
PROGRAM STEERING COMMITTEE

This MOU establishes and describes the working relationship between the UK Department of Landscape Architecture (LA) and the interdisciplinary Natural Resources and Environmental Science (NRES) undergraduate B.S. degree program Steering Committee.

Background:

The University of Kentucky College of Agriculture, Food and Environment (CAFE) is structured as a set of independently-functioning departments, most of which deliver undergraduate programs and confer a Bachelor's degree in a discipline strongly aligned with the academic discipline of the department. There are also several undergraduate programs within the UK CAFE that are interdisciplinary and interdepartmental, requiring collaboration and cooperation between or among two or more departments, primarily through the sharing of faculty and staff resources, to develop, maintain, and deliver these programs effectively. Within the UK CAFE there are several informal models for this collaborative arrangement, all of which rely on unwritten agreements between the Chair of the respective departments contributing to the program and the steering committee chair of the interdisciplinary program. This leaves interdisciplinary programs vulnerable to adverse effects of changes in department policy and decision making due to a number of factors including fluctuating budget models, budget and personnel constraints, changes in department focus, and changes in program and department leadership. Interdisciplinary programs do not have direct representation at the administrative level, which further emphasizes the need to provide a formalized and written collaborative framework between contributing departments and interdisciplinary programs like NRES. Likewise, departmental contributions to interdisciplinary programs need appropriate recognition by the College and consideration in budgeting and resource allocation decisions.

The LA department offers an undergraduate B.S. degree in Landscape Architecture and, along with several other departments, contributes faculty distribution of effort to the interdisciplinary NRES undergraduate B.S. program. While the two degrees differ markedly in course requirements and program goals, there is some overlap in required courses taught by LA faculty. In addition, elective courses for NRES students include several LA courses.

Purpose:

The purpose of this MOU is to articulate the ways in which NRES and LA collaborate to create a positive learning environment that fosters undergraduate and graduate student development, strengthening both programs in the process, and supporting faculty who contribute to both programs. In addition to supporting the goals of the LA and the NRES programs, this MOU strengthens CAFE's commitment to the educational portfolio in a natural resource and environmental sciences cluster of majors.

LA and NRES will accomplish the purpose of this MOU by engaging in the following activities:

LA will consult, and where appropriate and consistent with LA goals, objectives, and capacity, collaborate with the NRES Steering Committee in:

- Faculty and lecturer hiring, and inclusion of NRES responsibilities as appropriate in position descriptions.
- Allocation of new and established faculty and lecturer efforts in support of NRES teaching, advising, and NRES Steering Committee membership.
- Development of Faculty Distribution of Effort agreements to insure that faculty efforts adequately reflect NRES engagement and when possible potential needs of the NRES program.

LA and NRES agree to:

- Develop course scheduling to facilitate student participation from both programs as well as instructional efficiency.
- Share information about the programs to facilitate current and prospective students in finding the best fit for their undergraduate program and major.
- Be strong advocates for each other with CAFE administration, University, and extra-University interactions and partners.
- Explore and take advantage of shared degree and program marketing and recruiting opportunities and avoid, where possible, adverse effects to either program from independent marketing and recruitment efforts.
- Hold a formal meeting annually among the leaders of the two undergraduate programs, to include the LA Department Chair, the NRES Steering Committee Chair, and Directors of Undergraduate Studies of both programs, to foster communication and evaluate the effectiveness of the MOU and its provisions.

Funding:

There is no direct or concrete commitment of funds associated with this MOU. LA and NRES understand, however, that sharing faculty and staff efforts with an inter-departmental program has both monetary and non-monetary costs and benefits for all parties involved.

Duration and Modification:

This MOU may be modified by mutual consent of the faculty of the Department of Landscape Architecture and the Natural Resources and Environmental Science Steering Committee. Chairs, or appointed LA and NRES representatives, in consultation with the CAFE dean and/or representative, will make reasoned attempts to reconcile conflicts to avoid unilateral dissolution of the MOU by either LA or the NRES Steering Committee.



December 14, 2017

Ned Crankshaw
Chair
Department of Landscape Architecture

Date



December 19, 2017

Dr. Mary Arthur
Chair
Natural Resources and Environmental Science Undergraduate Degree Program Steering Committee

Date

This MOU was established with the consent of:



December 22, 2017

Dr. Nancy Cox
Dean, College of Agriculture, Food and Environment

Date

MEMORANDUM OF UNDERSTANDING
between
THE UK DEPARTMENT OF PLANT & SOIL SCIENCES FACULTY
and
THE NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE UNDERGRADUATE DEGREE
PROGRAM STEERING COMMITTEE

This MOU establishes and describes the working relationship between the UK Department of Plant & Soil Sciences (PSS) and the interdisciplinary Natural Resources and Environmental Science (NRES) undergraduate B.S. degree program Steering Committee.

Background:

The University of Kentucky College of Agriculture, Food and Environment (CAFE) is structured predominantly as a set of academic departments, most of which deliver undergraduate programs and confer a Bachelor's degree in a discipline strongly aligned with the academic discipline of the department. There are also several undergraduate programs within the UK CAFE that are interdisciplinary and interdepartmental, requiring collaboration and cooperation between or among two or more departments, primarily through the sharing of faculty and staff resources, to effectively and efficiently develop, maintain, and deliver these programs. Within the UK CAFE there are several informal models for this collaborative arrangement, all of which rely on unwritten agreements between the Chair of the respective departments contributing to the program and the steering committee chair of the interdisciplinary program. This can leave interdisciplinary programs secondary to changes in department policy and decision-making due to a number of factors including fluctuating budget models, budget and personnel constraints, changes in department focus, and changes in program and department leadership. Interdisciplinary programs are also hampered by not having direct representation at the administrative level, which further emphasizes the need to provide a formalized and written collaborative framework between contributing departments and interdisciplinary programs like NRES. Likewise departmental contributions to interdisciplinary programs need to be appropriately recognized by the College and taken into consideration in budgeting and resource allocation decisions.

The PSS department contributes to several degree programs, including Horticulture, Plant & Soil Sciences (HPLS), Sustainable Agriculture (SAG), and Agricultural and Medical Biotechnology (ABT), and, along with several other departments, contributes faculty distribution of effort to the interdisciplinary NRES undergraduate B.S. program. While these degrees differ markedly in course requirements and program goals, there is some overlap in required courses which are taught by PSS faculty, primarily with HPLS, SAG, and NRES. In addition, elective courses for NRES students include several PSS courses. A description of the NRES program follows.

The interdisciplinary and interdepartmental B.S. in Natural Resources and Environmental Science is designed to provide students with the knowledge and skills needed for a career in the rapidly growing fields of environmental science, natural resource management, and environmental policy. This curriculum provides students with exposure to a broad array of disciplines that are essential in approaching issues of natural resources, environmental quality, and environmental sustainability. All students in the program take a common core of major course requirements, which are designed to provide exposure to technical and socioeconomic dimensions of natural resource management and policy. In addition to the core requirements, all students must complete nine hours of course work in both an Analytical Skill Development Area (ASD) and an Environmental System Emphasis Area (ESEA). This allows students to match analytical skills to an area of particular interest in conservation biology, natural resource planning, environmental soil science, water resources, environmental education, forestry, wildlife management, agricultural sustainability, geological processes, or related areas. Courses for the ASD and ESEA are selected from a list of courses in each area, which are offered by multiple departments within UK CAFE and in other departments across the university. As part of the degree, students are required to complete an internship or an undergraduate research experience.

Purpose:

The purpose of this MOU is to articulate the ways in which NRES and PSS collaborate to create a positive learning environment that fosters undergraduate and graduate student development, strengthening both programs in the process, and supporting faculty who contribute to both programs. This MOU also makes explicit the contributions of the NRES program to the affiliated department (in this case PSS), and emphasizes the need for open communication between programs. In addition to supporting the goals of the PSS and the NRES programs, this MOU strengthens CAFE's commitment to the educational portfolio in a natural resource and environmental sciences cluster of majors.

The purpose of this MOU will be accomplished by engaging in the following activities:

PSS will consult, and where appropriate and consistent with PSS goals, objectives, and capacity, collaborate with the NRES Steering Committee in:

- Faculty and lecturer hiring, and inclusion of NRES responsibilities as appropriate in position descriptions.
- Allocation of new and established faculty and lecturer efforts in support of NRES teaching, advising, and NRES Steering Committee membership and leadership.
- Development of Faculty Distribution of Effort agreements to insure that faculty efforts adequately reflect NRES engagement and when possible potential needs of the NRES program.

PSS and NRES agree to:

- Develop course scheduling to facilitate student participation from NRES and other programs that PSS contributes to as well as instructional efficiency.
- Seek opportunities to share and facilitate access to equipment and supplies to improve instructional efficiency.
- Consider program and degree development to decrease the potential for competing or redundant programs.
- Share information about the programs to facilitate current and prospective students in finding the best fit for their undergraduate program and major.
- Be strong advocates for each other with CAFE administration, University, and extra-University interactions and partners.
- Explore and take advantage of shared degree and program marketing and recruiting opportunities and avoid, where possible, adverse effects to either program from independent marketing and recruitment efforts.
- Hold a formal meeting annually among the leaders of the relevant undergraduate programs, to include the PSS Department Chair, the NRES Steering Committee Chair, and Directors of Undergraduate Studies of NRES and other relevant programs, to foster communication and evaluate the effectiveness of the MOU and its provisions. Formal renewal of the MOU will occur every four years.

Funding:

There is no direct or concrete commitment of funds associated with this MOU. However, it is understood that sharing faculty and staff efforts with an inter-departmental program has both monetary and non-monetary costs and benefits for all parties involved.

Duration and Modification:

This MOU may be modified by mutual consent of the faculty of the Department of Plant & Soil Sciences and the Natural Resources and Environmental Science Steering Committee. Chairs, or appointed PSS and NRES representatives, in consultation with the CAFE dean and/or representative, will make reasoned attempts to reconcile conflicts to avoid unilateral dissolution of the MOU by either PSS or the NRES Steering Committee.

Rebecca L. McElroy

03/13/18

Date

Chair, Department of Plant & Soil Sciences

Mary A. Ardum

03/31/18

Date

Chair

Natural Resources and Environmental Science Undergraduate Degree Program Steering Committee

This MOU was established with the consent of:

Nancy M. Cox

04/24/18

Dr. Nancy Cox

Date

Dean, College of Agriculture, Food and Environment

BCTC EST Courses that Transfer to UK NRES - Entering in 2018 or later

Take this course at BCTC			Transfers to this course at UK for NRES	Or use it for one of your NRES emphasis area requirements													
				Analytical Skill Development Areas (ASD)					Environmental Systems Emphasis Area (ESEA)								
BCTC EST Courses		Credits	NRES Pre-major or major req	Field and Lab	Geospatial	Economics and Policy	Environmental Education	Individual ASD	Soil	Water	Wildlife	Forestry	Planning	Sustainable Ag	Conservation Biology	Geology	Individual ESEA
EST 270	Env. Law and Regulation	3	AEC 326 Princ. of Env. Law														
EST 170	Environmental Sampling Lab	2	It is preferred that you take NRE 320 Summer Camp, however, in some instances we will accept these two courses as a substitution	X													
EST 260	Environmental Analysis Lab	2		X						X	X						
EST 160	Hydrological Geology	3								X							
EST 220	Pollution of Aquatic Ecosyst.	3		X						X							X
EST 225	Survey of Freshwater Invert.	3		X						X	X						
EST 230	Aquatic Chemistry Laboratory	2		X						X							
EST 240	Sources and Effects of Air Poll.	4															X
EST 250	Solid and Hazardous Waste	3															X
EST 280	Environmental Trends Seminar	1															X
EST 299	Selected Topics in Env Sci. Tech	1-4															X

-EST 170 and EST 260 can be used as NRE 320 Summer Field Camp only if student has completed the EST program and proposes it to their NRES faculty advisor

-BCTC students can use all of the above courses towards the NRES degree and they are preapproved (substitution form only needed to tell us which concentration area you want them in)

-There is no limit on the number of EST courses that a student can use in their concentration areas

-NRES students can choose to take any of these courses at BCTC and apply them to their degree, however, NRES students cannot go back and take the EST 170/EST 260 combo to substitute for NRE 320

-Updated February 2018

Natural Resources and Environmental Science

MAJOR REQUIREMENTS

NRES ANCHOR COURSES

NRE 201 - Intro to Environmental Science

Introductory course into the major including the science and policy of natural resources, career pathways in the environment, and a field trip for a taste of real world experience.

NRE 471 - Senior Capstone Project

Students work in teams on a real world project applying their knowledge, skills, and abilities.

NRE 320 - Extended Field Experience

This is an experiential learning course. Choose between 15 days in Kentucky or 15 days in Costa Rica.

NRE 399/NRE 395 - Internship/Research Project

Provides real world experience in the student's chosen concentration area.

PRE-MAJOR MATH AND SCIENCE COURSES

MA 123 Calculus I

BIO 148/152 Biology I & II

CHE 105/111 Chemistry & Lab

STA 296 Statistics

UK Core Courses

NATURAL SCIENCES

- EES 220 – Geology
- FOR 340 – Ecology
- FOR 325 – Botany
- PLS 366 – Soils
- FOR 435 – Conservation Biology
- FOR 460/EES 385 – Hydrology

SOCIAL SCIENCES

- ECO 201 – Economics
- PHI 336 – Environmental Ethics
- NRE 381 – Environmental Policy
- NRE 355 – Geospatial Applications
- AEC 326 – Environmental Law
- AEC 445 – Environmental Economics

Students then choose TWO concentration areas (one analytic area and one environmental area)

ANALYTIC AREA

(3 courses in one of the following topics)

- Economics/Policy
- Field/Laboratory Analysis
- Environmental Education/Communication
- GIS/Computer Mapping
- Individualized (*Choose Your Own Pathway*)

ENVIRONMENTAL AREA

(3 courses in one of the following topics)

- Forestry
- Geology
- Conservation Biology
- Environmental Planning
- Sustainable Agriculture
- Individualized
- Soils
- Water
- Wildlife

NRES EXPERIENTIAL LEARNING EXAMPLES

NRES INTERNSHIPS

KY Department of Fish and Wildlife (KY)
Kentucky Wildlife Center (KY)
Glasgow Water Company (KY)
LFUCG Division of Water Quality (KY)
Raven Run Nature Sanctuary (KY)
Salato Wildlife Education Center (KY)
KY Dept. of Environmental Protection (KY)
KY Division of Mine Reclamation (KY)
Eco-Tech Consultants (KY)
Stantec Consulting (KY)
Aquatic Resources Management (KY)
American Chemical Technologies (KY)
Louisville Gas and Electric (KY)
TerraCycle (NJ)

Savannah River Nuclear Solutions (SC)
Teton Science School (WY)
National Aquarium in Baltimore (MD)
Canoe Kentucky (KY)
The Sonoran Institute (AZ)
Colorado Ocean Coalition (CO)
Cook Inlet Aquaculture Association (AK)
NOAA Fisheries Service (FL)
Student Conservation Association (IA, CO)
US Department of Fish and Wildlife (various)
National Resources Conservation Service (TX)
US Army Corps of Engineers (KY)
US Forest Service (KY)
Mammoth Cave National Park (KY)

RESEARCH

- UK Herpetology Lab
- UK Rhizophere Lab
- UK Hymenoptera Institute
- REU Univ. of Florida
- UK Department of Forestry (bats, trees, fire, urban forestry...)
- UK Department of Biology (birds, turtles, salamanders...)

EDUCATION ABROAD

- Thailand (Crops, Soils, Marine Biology)
- Iceland (Geothermal Energy)
- Germany (Sustainability)
- Belize (Sustainable Agriculture)
- Peru and Mongolia (Peace Corps)
- South Africa (Ecology and Global Change)
- New Zealand (Env. Management)
- Spain, England, Ireland, Costa Rica, Tanzania, and more!

STUDENTS CHOOSE BETWEEN TWO FIELD STUDY COURSES

KENTUCKY

(Robinson Forest and some travel)

- Three weeks in May (weekends off)
- 1-2 instructors plus guest speakers
- Activities and lectures (hands-on)
- Based in one location
- Topics: Hydrology, wildlife, soils, vegetation, stream restoration, forest measurements

COSTA RICA

(Travel to 6+ locations across the country)

- 15 days in July/August
- 1-2 instructors plus guest speakers
- Tours, activities, and lectures
- Travel every few days
- Topics: Tropical biology, sustainable agriculture, deforestation, ecotourism

Natural Resources & Environmental Science



College of Agriculture, Food & Environment

N6 Agricultural Science Center Contact: Wayne Centers - dsr@uky.edu

The Natural Resources and Environmental Science (NRES) major is an interdisciplinary program that provides the knowledge, skills, and field experiences necessary for a career in environmental science, natural resource management, environmental consulting and other environmental work.

Total Hours Required for Degree: 120 - 127

Freshman Year Credit Hours: 30

FALL SEMESTER	14	SPRING SEMESTER	16
GEN 100 GEN 100 - ISSUES IN AGRICULTURE, FOOD AND ENVIRONMENT	3	MA 123 MA 123 - ELEMENTARY CALCULUS AND ITS APPLICATIONS	4
UK Core - Comp. & Comm. I	3	UK Core - Comp. & Comm. II	3
CHE 105 CHE 105 - GENERAL COLLEGE CHEMISTRY I	4	UK Core - Global Dynamics	3
CHE 111 CHE 111 - GENERAL CHEMISTRY I LABORATORY	1	UK Core - Humanities	3
UK Core - Arts and Creativity	3	UK Core - Social Sciences	3

Sophomore Year Credit Hours: 29

FALL SEMESTER	15	SPRING SEMESTER	14
ECO 201 ECO 201 - PRINCIPLES OF ECONOMICS I	3	EES 220 EES 220 - PRINCIPLES OF PHYSICAL GEOLOGY	4
STA 296 STA 296 - STATISTICAL METHODS AND MOTIVATIONS	3	BIO 152 BIO 152 - PRINCIPLES OF BIOLOGY II	3
NRE 201 NRE 201 - NATURAL RESOURCE CONSERVATION AND MANAGEMENT	3	NRE 381 NRE 381 - NATURAL RESOURCE AND ENVIRONMENTAL POLICY ANALYSIS	3
BIO 148 BIO 148 - INTRODUCTORY BIOLOGY I	3	PLS 366 PLS 366 - FUNDAMENTALS OF SOIL SCIENCE	4
PHI 336 PHI 336 - ENVIRONMENTAL ETHICS	3		

Sophomore Year Credit Hours: 19

SUMMER SEMESTER	3	FALL SEMESTER	16
NRE 320 NRE 320 - DATA COLLECTION TECHNIQUES	3	FOR 325 FOR 325 - ECONOMIC BOTANY: PLANTS AND HUMAN AFFAIRS	3
		FOR 340 FOR 340 - FOREST ECOLOGY	4
		AEC 326 AEC 326 - PRINCIPLES OF ENVIRONMENTAL LAW	3
		ASD or ESEA course	3
		ASD or ESEA course	3

Junior Year Credit Hours: 14 - 19

SPRING SEMESTER	13 - 16	SUMMER SEMESTER	1 - 3
AEC 445G AEC 445G - INTRODUCTION TO RESOURCE AND ENVIRONMENTAL ECONOMICS	3	NRE 395 or NRE 399	1 - 3
NRE 355 NRE 355 - INTRODUCTORY GEOSPATIAL APPLICATIONS FOR LAND ANALYSIS	3		
ASD or ESEA course	3		
ASD or ESEA course	3		
Elective	1 - 4		

Senior Year Credit Hours: 21 - 30

FALL SEMESTER	12 - 15	SPRING SEMESTER	9 - 15
FOR 460G or EES 385	3	NRE 471 NRE 471 - SENIOR PROBLEM IN NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE	4
ASD or ESEA course	3		
ASD or ESEA course	3	FOR 435 FOR 435 - CONSERVATION BIOLOGY	3
NRE 400 NRE 400 - PROFESSIONAL NRES COMPOSITION AND COMMUNICATION	2	Elective	1 - 4
Elective	1 - 4	Elective	1 - 4

University of Kentucky is accredited by the Southern Association of Colleges and Schools Commission on Colleges to award associate, baccalaureate, masters, and doctorate degrees. Contact the Commission on Colleges at 1866 Southern Lane, Decatur, Georgia 30033-4097, call 404-679-4500, or online at www.sacscoc.org for questions about the accreditation of University of Kentucky.

Current UK students: Please login to <http://myUK.uky.edu> to access your personalized major map and UKY Major Map
 Natural Resources & Environmental Science
 Tuesday, February 23, 2021

degree audit via the Graduation Planning System (GPS). This major map is the curriculum requirements for completion of the degree program only and is not a personalized audit based on your completed coursework. This major map does not reflect entrance requirements for selective majors. Please consult with the college to learn more about admission to this major.

NRES Self Study Student and Alumni Survey

Q12 Every 5-7 years the Natural Resources and Environmental Science (NRES - once NRCM) program undergoes a periodic review. The periodic review allows the program and University to track how well we are meeting the needs of our students, identify strengths and weakness, and set a path for the future. This process is designed to improve the quality and effectiveness of teaching and learning, research, public service, and operations. It is important to the Steering Committee and Review Board to hear from current students and alumni about their experience during, and after the NRES program. Please take a few moments to complete this survey, it should take about 10 minutes.

Q3 I started in the NRES program approximately on _____

Q6 I chose the NRES program because

Q7 How well do the following statements describe your professional development?

	Strongly Disagree (1)	Disagree (2)	No Opinion (3)	Agree (4)	Strongly Agree (5)
Helped me on my professional journey (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I needed additional education and training beyond the NRES degree (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q9 How well do the following statements describe your experience with the NRES program?

	Strongly Disagree (1)	Disagree (2)	No Opinion (3)	Agree (4)	Strongly Agree (5)
The chance to get to know other NRES students was important to me (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My advisor(s) were personable and relatable (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My advisor was well-informed about technical aspects of the NRES program (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advising communication was straightforward and prompt (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The NRES internship forum helped me learn about the many directions a student can take (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are so many students in NRES that I felt/feel like I fall through the cracks (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRES could grow without losing a sense of connectedness (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q10 How well do the following statements describe your experience with the NRES Curriculum?

	Strongly Disagree (1)	Disagree (2)	No Opinion (3)	Agree (4)	Strongly Agree (5)
Core NRES experiences like camp, internships, and senior capstone helped me build towards a career in the environment (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I enjoyed the chance to pick a concentration (ASD/ESEA) and courses for my degree program (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sometimes, I wish I had enrolled in a program that told students what courses to take (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: NRES Curriculum

Start of Block: Access to NRES

Q11 How well do the following statements describe your experience with the NRES program?

	Strongly Disagree (1)	Disagree (2)	No Opinion (3)	Agree (4)	Strongly Agree (5)
I wish the students in the NRES program were more diverse (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wish the faculty in the NRES program were more diverse (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am more likely to engage in environmental issues that connect with my life story (4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I go to environmentally-related meetings or events, I find a diverse group of people engaged (5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRES should add course work to introduce topics around diversity, equality and inclusion (DEI) (6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
DEI should be integrated fully into the NRES curriculum (7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q12 How well do the following statements describe your professional experience after the NRES program?

	Strongly Disagree (1)	Disagree (2)	No Opinion (3)	Agree (4)	Strongly Agree (5)
The breadth of the NRES program helped position me for success in my profession (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I had a chance, I would have enrolled in a "5th year" (4+1 format) master's program (2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have noticed that people with a more focused undergraduate major are able to make better progress in their professions (3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q13 If you could change one thing about the program, what would it be?"

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

INSTRUCTIONS

The faculty of each academic program, degree or certificate, are asked to complete this plan template during the 2019-20 academic year to guide assessment of the program-level student learning outcomes (PSLOs) during the [upcoming cycle](#). Assessment plans are due to the Office of Strategic Planning & Institutional Effectiveness (OSPIE) no later than **April 15, 2020** and should be submitted to the appropriate college and program folder in [SharePoint](#).

A [Quick Start Guide and other documentation](#) as well as dates for live [training sessions](#) are provided on the OSPIE website. Training resources and session topics range from an overview of the new assessment process to principles and practice for student learning outcome assessment. Questions can be directed to [OSPIE staff](#).

Reading the Quick Start Guide prior to completing the new plan template is strongly encouraged.

ABOUT THE PROGRAM

College or School *(example: College of Arts & Sciences)*

Collage of Agriculture Food and the Environment (CAFE)

Degree Type *(example: BA or MS)*

BS

Program Name *(example: History)*

Natural Resources and Environmental Sciences

Please provide the mission statement for the program. If one does not currently exist, provide the department or college mission statement.

The **mission** of the NRES program is to educate undergraduate students so that they have a thorough understanding of the science and policy underlying natural resource and environmental issues in contemporary society. In doing so we enable our students to become effective problems solvers in preparation for their work to preserve and protect natural resources. To accomplish this, the program uses a cross disciplinary approach

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

to educate students in the fundamental principles of basic natural and social sciences, laying the foundation for a deeper understanding and the ability to integrate these principles across disciplines.

(Optional) Include any additional information about the program's history, development, or structure that may be beneficial in understanding the curriculum and how student learning is assessed.

The **vision** of the NRES program is to be recognized for its effective development of leaders in natural resources and environmental problem-solving throughout Kentucky and beyond, through the work our graduates do across many professional roles, including environmental law, environmental consulting, governmental agencies, environmental education, reforestation and restoration, natural lands management and stewardship, wildlife management, conservation biology, biological monitoring, etc..

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, through broad-based education opportunities for discussion, group projects, and study abroad opportunity.
3. To prepare students to contribute to the improvement of the environment and quality of life for humans.

ASSESSMENT CYCLE

All programs that do not have specialized accreditation and are not located in a department/college with a specialized accreditation should follow a [4-year PSLO assessment cycle](#). Programs that have specialized accreditation(s) or are within a college that has a comprehensive accreditation can develop an alternate PSLO and periodic review cycle in consultation with OSPIE.

Which cycle will the program being using?

- 4-year cycle [\[What does this look like?\]](#)
- Other (accredited programs/departments only)

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

If the program has selected "other" for the assessment and periodic review cycle, please append a copy of the proposed cycle and a brief justification to this plan.

ASSESSMENT COORDINATION AND RESOURCES

Individual(s) coordinating program-level student learning outcomes assessment

First and Last Name	Title/Position	Email
Dr. Larry Grabau	Professor	larry.grabau@uky.edu
Adia Sovie	Academic Coordinator	adia.sovie@uky.edu

Other individuals providing oversight, coordination, or support for assessment

First and Last Name	Title/Position
Dr. David McNear	Associate Professor

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

(Optional) Other utilized resources for assessment (e.g. software such as rubrics or portfolios, evaluator stipends, etc.)

--

PROGRAM-LEVEL STUDENT LEARNING OUTCOMES

Please list the program-level student learning outcomes (PSLOs). If applicable, indicate which, if any, outcomes are required by your specialized accreditor(s) [\[What is this?\]](#). Bachelor's degree programs must also indicate which outcome(s) map to the university's GCCR ([Graduation Composition & Communication Requirement](#)). The GCCR is not a requirement for certificates, graduate, or professional programs.

Space for up to 10 PSLOs has been provided below, but this does not imply that 10 outcomes are required. Program faculty should decide the appropriate number based on the design of the curriculum. Most programs have 3-8 outcomes, depending on the length of the program. If more than 10 lines are needed, either insert more lines into the table or submit a request to OSPIE@uky.edu for a template with additional lines for PSLOs.

PSLO #	Program-level Student Learning Outcome Statement (How should these be written?)	Required by Specialized Accreditor(s)?	Mapped to GCCR? (Undg degrees only)
<i>Example</i>	<i>Graduates will be able to critically evaluate scientific literature related to drugs and disease to enhance clinical decision-making.</i>	<input type="checkbox"/>	<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

PSLO #	Program-level Student Learning Outcome Statement <i>(How should these be written?)</i>	Required by Specialized Accreditor(s)?	Mapped to GCCR? <i>(Undg degrees only)</i>
1	Students will <u>demonstrate proper data collection methods and analysis techniques</u> in field and laboratory settings to solve fundamental and quantitative problems involving contemporary and emerging, local, regional and/or global natural resource and environmental issues.	<input type="checkbox"/>	<input type="checkbox"/>
2	Students will be able to <u>integrate principles of human systems</u> such as those found in history, law, public policy, ethics, and economics, to find solutions for contemporary and emerging, local, regional and/or global natural resource and environmental issues.	<input type="checkbox"/>	<input type="checkbox"/>
3	Students will <u>demonstrate their ability to draw conclusions and make recommendations</u> based on an interdisciplinary understanding of contemporary and emerging, local, regional and/or global natural and human systems principles and perspectives.	<input type="checkbox"/>	<input type="checkbox"/>
4	(GCCR) Students will demonstrate their <u>ability to function as part of a multidisciplinary team</u> and be able to <u>effectively communicate natural resource and environmental issues</u> in written, oral, and visual formats to professionals and community stakeholders.	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5		<input type="checkbox"/>	<input type="checkbox"/>
6		<input type="checkbox"/>	<input type="checkbox"/>

Please provide a brief description of the process used to develop or revise current PSLOs and the extent to which program faculty were involved. If applicable, provide discussion of any attempts to align PSLOs with professional or accreditation standards, employer expectations and job skills, graduate program curricula, etc. If PSLOs are taken directly from an accreditor, discuss whether (and how) the PSLO statements were reviewed by the faculty to ensure they were comprehensive.

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

The NRES curriculum assessment sub-committee will meet twice per year to evaluate assessment materials and modify them when necessary. The NRES steering committee meets frequently (3-4 times) throughout the year during which time the assessment sub-committee will solicit input and provide updates on assessment progress.

CURRICULUM MAP

Please create a map of the PSLOs to the curriculum. All required courses should be included in the left-hand column, and all PSLOs should span across the remaining columns. If desired, specific elective courses or elective “tracks” can be included (recommended). The purpose of the curriculum map is to show where each PSLO is emphasized within the curriculum. The level at which each PSLO is taught within a given course should be indicated as follows: introductory (I); reinforced (R); or mastery (M). Each PSLO should have at least an instance of I, R, and M across the curriculum, with the exception of certain graduate programs where introductory knowledge is provided at the undergraduate level. For assistance in developing a curriculum map, please visit the [OSPIE website](#) or contact the [OSPIE team](#).

Learning Outcomes CURRICULUM Map		PSLO	PSLO	PSLO	PSLO
Natural Resources and Environmental Sciences		1	2	3	4
<i>(Version – Nov. 1, 2018)</i>					
UK CORE	GEN 100 Issues in Agriculture	----	I	I	I
	STA 296 Statistical Method and motivations	I	----	----	----
	MA 123 Elementary Calculus and Its Applications (or MA109)	I	----	----	----
	CHE 105 General College Chemistry I	----	----	I	----
	CHE 111 Laboratory to Accompany General Chemistry I	I	----	I	I
Pre-major Requirements	BIO 148 Principles of Biology I	I	----	I	----
	BIO 152 Principles of Biology II	I	----	I	----
	ECO 201 Principles in Economics I	----	I	I	----
	EES 220 Principles of Physical Geology	----		I	

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

Major Requirements	Sophomore	NRE 201 Natural Resources and Environmental Science		R	R	R
		FOR 435 Conservation Biology	R	R	R	R
		PHI 336 Forestry and Natural Resource Ethics	R	R	R	R
		NRE 381 Natural Resource and Environmental Policy Analysis	----	I	R	R
		NRE 355 Geographic Information Systems and Landscape Analysis	----	----	R	R
		NRE 320 Natural Resource and Environmental Analysis	----	I	R	M
	Junior	PLS 366 Fundamentals of Soil Science	R	----	R	R
		AEC 445G Introduction to Resource and Environmental Economics	----	I	M	R
		AEC 326 Principles of Environmental Law	----	R	M	R
		FOR 340 Forest Ecology	M	----	R	R
		FOR 325 Economic Botany: Plants and Human Affairs		R	R	R
	Senior	FOR 460 Forest Hydrology and Watershed Management	R	R	R	M
		NRE 471 Senior Problem in Natural Resources and Environmental Science	M	M	M	M
		NRE 395 Independent Study in Natural Resources and Environmental Science	<i>varies</i>	<i>varies</i>	<i>varies</i>	E
		NRE 399 Experiential Ed. in Natural Resources and Environmental Science	<i>varies</i>	<i>varies</i>	<i>varies</i>	E

I = Introduced; indicates that students are introduced to the outcome

R = Reinforced and opportunity to practice; indicates the outcome is reinforced and students afforded opportunities to practice

M = Mastery at the senior or exit level; indicates that students have had sufficient practice and can now demonstrate mastery

ASSESSMENTS

Please complete the chart below by listing each assessment on a separate row, and including the requested information. Except for outcomes that focus on students' values or beliefs, at least 1 assessment should be [direct](#). Ideally, all outcomes should have at least 2 assessments. I

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

available, append a copy of the assessment measure/instrument (e.g. scoring rubric or sample questions) to this report. If a goal/target has already been set or can be set for a given measure/instrument, this should be included in the table. Otherwise, the program will need to determine and specify a target/goal when results are first reported for that instrument/measure. Note: space for only 15 instruments/measures have been provided. If space for additional assessment instruments/measures are needed, either insert additional rows into the table or contact [OSPIE staff](#) to receive a customized template with additional lines.

Assessment Instrument/ Measure Name	PSLO(s) Mapped to	Assessment Type (Direct or Indirect)	Assessment Instrument/Measure Description (What is this?)	Assessment Instrument/Measure Rationale (What is this?)	Benchmark or Goal (If Available) (What is this?)	Course(s) (If applicable)	Rubric or Example Appended?
<i>Example: SPIE 430 Final Paper</i>	<i>1,3</i>	<i>Direct</i>	<i>Students complete the final paper individually on a relevant & timely topic related to program assessment. Papers are scored by the course instructor using a standard rubric developed by members of the department curriculum committee. No sampling will be done; however, non-SPIE majors will be excluded from the results. The scores for criteria 1-2 will be used for PSLO1 and criteria</i>	<i>Measure was chosen because it provides evidence of student achievement near end of program and multiple criteria on rubric align directly to outcomes 1 & 3. Curriculum committee recently (2018) reviewed assignment instructions, rubric, and samples of student work to ensure good alignment with outcomes. In the future, multiple evaluators will be used to score a sample of student work and estimate</i>	<i>95% of students will earn a 3 or better on each criterion (on a 4-point scale)</i>	<i>SPIE 430: Advanced Program Assessment Design</i>	<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

Assessment Instrument/ Measure Name	PSLO(s) Mapped to	Assessment Type (Direct or Indirect)	Assessment Instrument/Measure Description (What is this?)	Assessment Instrument/Measure Rationale (What is this?)	Benchmark or Goal (If Available) (What is this?)	Course(s) (If applicable)	Rubric or Example Appended?
			4-7 for PSLO3 (see attached rubric).	reliability (interrater agreement) of the rubric.			
Soil Microbiology Lab	1	Direct	Soil microbiology lab – involves an experiment on microbial respiration, interpretation of reaction stoichiometry and the calculation of CO ₂ -C evolution.		95% of students will earn a 3 or better on each criterion (on a 4-point scale)	PLS 366	<input type="checkbox"/>
Final lab score	1	Direct	Final lab score		95% of students will earn a 3 or better on each criterion (on a 4-point scale)	CHE111	<input type="checkbox"/>
Four-page (double spaced) (12 pt. font) position paper	1	Direct	four-page (double spaced) (12 pt. font) position paper on whether or not the EPA's conductivity rule is fair. Use information from the literature to justify (support) your position. Given that this is a "Watershed Management" class, identify potential impacts that the adoption or dismissal of this guidance rule could have on water resources		95% of students will earn a 3 or better on each criterion (on a 4-point scale)	FOR 460	<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

Assessment Instrument/ Measure Name	PSLO(s) Mapped to	Assessment Type (Direct or Indirect)	Assessment Instrument/Measure Description (What is this?)	Assessment Instrument/Measure Rationale (What is this?)	Benchmark or Goal (If Available) (What is this?)	Course(s) (If applicable)	Rubric or Example Appended?
Survey and final capstone report	1	Indirect/direct	Exit survey by audience members/stakeholders at the NRE471 capstone project presentation. Final capstone report.	Survey and report provides direct and indirect assessment of how well students <u>demonstrate proper data collection methods and analysis techniques</u> in field and laboratory settings to solve fundamental and quantitative problems involving contemporary and emerging, local, regional and/or global natural resource and environmental issues.	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	NRE 471	<input type="checkbox"/>
Bulk Density & Soil Water lab report	1	Direct	A lab report in which students have to collected bulk density and infiltration measurements from field sites, perform calculations, make graphics, interpret data, and make recommendations		95% of students will earn a 3 or better on each criterion (on a 4-point scale)	PLS 366	<input type="checkbox"/>
Short writing assignment	2	Direct	Typically short (10-15 minute) in-class writing periods to think and write about a particular question(s) or problem(s) presented in the reading or other assignment, and/or from that day's lecture and discussion material. These will be graded more on the quality (clarity, thoughtfulness, logic, etc.) of your response and overall effort then on other grammatical criteria given the short time limit.	Many of the in class writing require that student integrate principles of human systems such as those found in history, law, public policy, ethics, and economics, and consider solutions for contemporary and emerging, local, regional and/or global natural resource and environmental issues.	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	FOR435	<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

Assessment Instrument/ Measure Name	PSLO(s) Mapped to	Assessment Type (Direct or Indirect)	Assessment Instrument/Measure Description (What is this?)	Assessment Instrument/Measure Rationale (What is this?)	Benchmark or Goal (If Available) (What is this?)	Course(s) (If applicable)	Rubric or Example Appended?
Case studies	2	Direct	Integrate key concepts and analytical tools and apply them to understanding a real-life environmental issue. For each assigned case, students will conduct some economics analysis based on a model provided and also write a report, which should be typed and about 4-5 pages long (double-spaced). For each assigned case, student is also responsible for leading the discussion during class.	Many of the case studies require that student integrate principles of human systems such as those found in history, law, public policy, ethics, and economics, and consider solutions for contemporary and emerging, local, regional and/or global natural resource and environmental issues.	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	AEC 445G	<input type="checkbox"/>
Land Use Project	3	Direct	Student will select a 300-500 acre piece of land and make management and development decisions based on the using the soil science knowledge they gained over the semester	The land use project require that the students demonstrate their ability to draw conclusions and make recommendations based on an interdisciplinary understanding of natural and human systems principles and perspectives.	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	PLS 366	<input type="checkbox"/>
Final GIS project	3	Direct	Students will work independently to identify a Kentucky or Bluegrass research question or problem and use GIS to achieve a research objective.	The final GIS project require that the students demonstrate competencies in areas of data acquisition and transformation, spatial analysis, and cartographic representation to draw conclusions and make recommendations based on an interdisciplinary understanding of natural and human systems principles and perspectives. Students will.	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	NRE 355	<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

Assessment Instrument/ Measure Name	PSLO(s) Mapped to	Assessment Type <i>(Direct or Indirect)</i>	Assessment Instrument/Measure Description <i>(What is this?)</i>	Assessment Instrument/Measure Rationale <i>(What is this?)</i>	Benchmark or Goal <i>(If Available)</i> <i>(What is this?)</i>	Course(s) <i>(If applicable)</i>	Rubric or Example Appended?
Team Project (group of 5) written report.	3	Direct	Students will make a determination on whether or not the water quality is impaired. You will evaluate the geomorphology of the stream. Subsequently, you will be responsible for writing a technical report pertaining to your findings. The report should indicate how the stream segment functions from a stream continuum perspective, how land management procedures within the watersheds have contributed to the results obtained, and how the conditions may influence downstream segments. Finally, you should make some recommendations on how to better manage these areas (BMPs), and/or make suggestions that would improve the current conditions from an ecological, environmental, social or economic standpoint.	The final team project requires that the students demonstrate competencies in areas of data acquisition, interpretation to draw conclusions about the quality of a stream and make recommendations based on an interdisciplinary understanding of natural and human systems principles and perspectives to improve the current conditions from an ecological, environmental, social or economic standpoint.	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	FOR 460	<input type="checkbox"/>
Research paper and capstone presentation	4 (GCCR)	Direct	A research paper (4500 word minimum, double-spaced, 12 pt font, 1 inch margins) will be prepared based on the results of the research conducted/project undertaken and integrate elements of your ASD and/or ESEA. Data and results can be	Student works as part of a multidisciplinary team to develop a report on a local issue of ineests and then effectively communicate their findings in a final written report, oral group presentation, and other visual formats to	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	NRE395/399/NRE400	<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

Assessment Instrument/ Measure Name	PSLO(s) Mapped to	Assessment Type (Direct or Indirect)	Assessment Instrument/Measure Description (What is this?)	Assessment Instrument/Measure Rationale (What is this?)	Benchmark or Goal (If Available) (What is this?)	Course(s) (If applicable)	Rubric or Example Appended?
			presented in tables and/or figures as appropriate. The title page, acknowledgments, and references do not count towards the 4500 word minimum.	professionals and community stakeholders.			
Capstone presentation exit survey	4	indirect	Exit survey by audience members/stakeholders at the NRE471 capstone project presentation. Final capstone report.	The exit survey from audience members and stakeholders will provide an assessment of how effective the student were at communicating their findings	95% of students will earn a 3 or better on each criterion (on a 4-point scale)	NRE400	<input type="checkbox"/>
Senior Exit Survey	1,2,3,4	Indirect	Senior exit survey is				<input type="checkbox"/>

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

ASSESSMENT REPORTING CYCLE

Please complete the chart below by providing the requested information for each learning outcome. Note: space for up to 10 PSLOs has been provided. If space for additional PSLOs are needed, either insert additional rows into the table or contact the [OSPIE staff](#) to receive a customized template.

PSLO #	Semester/ Year(s) Data Collected	Year(s) Results Submitted to OSPIE <small>(see Results Report Definition)</small>	Year(s) Reflection Report Submitted to OSPIE <small>(see Reflection Report Definition)</small>	Year(s) Action Report Submitted to OSPIE <small>(see Action Report Definition)</small>
<i>Example</i>	<i>Fall / 2020</i>	<i>Summer 2021</i>	<i>Summer 2023</i>	<i>Summer 2024</i>
1	Fall/2021	Summer 2022	Summer 2024	Summer 2024
2	Fall/2021	Summer 2022	Summer 2024	Summer 2024
3	Fall/2022	Summer 2023	Summer 2025	Summer 2026
4	Fall/2022	Summer 2023	Summer 2025	Summer 2026

FEEDBACK AND SUPPORT ON PSLO ASSESSMENT PLAN

Each program has the option of receiving formative feedback on its new or revised PSLO assessment plan from OSPIE staff members. OSPIE staff can provide suggestions for improvement to learning outcome statements, overall assessment plan design, curriculum mapping, standard setting, individual assessment tools, etc. If your program would like to receive feedback on its assessment plan, please indicate below:

Yes, we would like to receive feedback.

Program-level Student Learning Outcomes Assessment Plan Template

Academic Degree Programs

University of Kentucky

- No thank you, not at this time.

If there are questions the program director or faculty did not have the opportunity to ask prior to submission of the PSLO assessment plan, and you would like to schedule a brief consultation with OSPIE staff, please indicate below:

- Yes, we would like to schedule an individual or group consultation.
- No thank you, not at this time.

B.S. Natural Resources and Environmental Sciences Student Learning Outcomes Assessment Plan



Steering Committee Members:

Faculty:

Mary Arthur (FOR) – Chair
 Brian Lee (LA) - DUS
 David H. McNear Jr. (PLS)
 Chris Matocha (PLS)
 Robert Paratley (FOR)
 Jack Scheiffer (AGEC)
 Chris Sass (LA)
 Steve Price (FOR)
 Kevin Yeager (EES)
 Chris Barton (FOR)
 Christopher Shepard (PLS)
 Lynn Roche (GEO)

Academic Coordinator:

NRES Alumna: Sandra Broadus

1. Introduction:	3
1.1. Unit Mission, Vision and Goals:	3
1.2. Basic Assessment Approach.....	3
1.3. Definition of Key Terms	3
2. Assessment Oversight, Resources.....	3
2.1. College Learning Outcomes Assessment Coordinator:.....	3
2.2. Unit Assessment Coordinator	3
2.3. Other Assessment Resources	4
3. Program-Level Learning Outcomes.....	4
3.1. Learning Outcomes by Program (Version – 04/08/15)	4
4. Curriculum Map	5
5. Assessment Methods and Measures	6
5.1 Artifacts used for FORMATIVE ASSESSMENT	6
5.2. Artifacts used for SUMMATIVE ASSESSMENT (collected annually):.....	7
6. Data Collection and Review	7
6.1. Data Collection Process/Procedures.....	7
6.2. Detailed Artifact Map	7
7. Assessment Cycle and Data Analysis.....	9
7.1 Assessment Cycle.....	9
8. Teaching Effectiveness.....	9
8.1. Identify measures of teaching effectiveness	9
8.2. What efforts to improve teaching effectiveness will be pursued based on these measures?	9

9. What are the plans to evaluate students' post-graduate success?	10
10. Appendices.....	11
10.1 Appendix A – Senior Capstone (NRE471) survey	11
10.2 Appendix B - Internship forum survey	13
10.3 Appendix C – Senior Exit Survey	14
10.4 Appendix D – LO1 Rubric (general problem solving)	23
10.5 Appendix E –LO2 Rubric (applied problem solving).....	25
10.6 Appendix F – LO3 Rubric (applying principles of human systems to address natural resource issues)	27
10.7 Appendix G – LO4 Rubric (data collection and analysis).....	29
10.8 Appendix H – LO5 Rubric (GCCR)	31
10.9 Appendix I – LO6 Rubric (ability to draw conclusions and make recommendations)	33
10.10 Appendix J – LO7 Rubric (function as part of a multidisciplinary team)	35
10.11 Appendix K – LO8 Rubric (demonstrated ability to analyze environmental issues)	37

1. Introduction: College of Agriculture, B.S. Natural Resources and Environmental Sciences Assessment Plan

1.1. Unit Mission, Vision and Goals:

The **mission** of the NRES program is to educate undergraduate students so that they have a thorough understanding of the science and policy underlying natural resource and environmental issues in contemporary society. In doing so we enable our students to become effective problems solvers in preparation for their work to preserve and protect natural resources. To accomplish this, the program uses a cross disciplinary approach to educate students in the fundamental principles of basic natural and social sciences, laying the foundation for a deeper understanding and the ability to integrate these principles across disciplines.

The **vision** of the NRES program is to be recognized for its effective development of leaders in natural resources and environmental problem-solving throughout Kentucky and beyond, through the work our graduates do across many professional roles, including environmental law, environmental consulting, governmental agencies, environmental education, reforestation and restoration, natural lands management and stewardship, wetlands delineation, wildlife management, conservation biology, biological monitoring (add to the list as you see fit).

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, through broad-based education opportunities for discussion, group projects, and study abroad opportunity.
3. To prepare students to contribute to the improvement of the environment and quality of life for humans.

1.2. Basic Assessment Approach

Assessment of the NRES program will be conducted on a three year cycle starting in 2018-2019 with LO 1, 2 and 4 and continuing with LO 2, 3 and 4 in 2019-2020, and finally LOs 1, 3 and 7 in 2020-2021. Assessment of each learning outcome will include artifacts from courses in which LOs are first introduced, emphasized and then reinforced in order to assess attainment of the LO as a student matures in the program.

1.3. Definition of Key Terms

NRES- Natural Resources and Environmental Sciences

PLS- Plant and Soil Sciences

ASD – Analytical Skill Development Area

BAE – Biosystems and Agricultural Engineering

ESEA – Environmental Systems Emphasis Area

2. Assessment Oversight, Resources

2.1. College Learning Outcomes Assessment Coordinator:

Larry Grabau, Associate Dean for Instruction, N-6 Ag Science North, (859) 257-3468 lgrabau@uky.edu

2.2. Unit Assessment Coordinator

Assessment will be coordinated by Dr. David H. McNear Jr., Director of Undergraduate Studies for NRES, NRES steering committee member, and faculty member of the Department of Plant and Soil Sciences. Ms. Geri Philpott, NRES academic coordinator, will be responsible for collecting and organizing all artifacts. Assessment of the artifacts will be conducted by the NRES assessment sub-committee chaired by Dr. David H. McNear Jr and comprised of 3 other members of the NRES steering committee.

2.3. Other Assessment Resources

The NRES curriculum assessment sub-committee will meet twice per year to evaluate assessment materials and modify them when necessary. The NRES steering committee meets frequently (3-4 times) throughout the year during which time the assessment sub-committee will solicit input and provide updates on assessment progress.

3. Program-Level Learning Outcomes

3.1. NRES Learning Outcomes (Version – 11/1/18)


1. Students will demonstrate proper data collection methods and analysis techniques in field and laboratory settings to solve fundamental and quantitative problems involving contemporary and emerging, local, regional and/or global natural resource and environmental issues.
2. Students will be able to integrate principles of human systems such as those found in history, law, public policy, ethics, and economics, to find solutions for contemporary and emerging, local, regional and/or global natural resource and environmental issues.
3. Students will demonstrate their ability to draw conclusions and make recommendations based on an interdisciplinary understanding of contemporary and emerging, local, regional and/or global natural and human systems principles and perspectives.
4. (GCCR) Students will demonstrate their ability to function as part of a multidisciplinary team and be able to effectively communicate natural resource and environmental issues in written, oral, and visual formats to professionals and community stakeholders.

4. Curriculum Map

Learning Outcomes CURRICULUM Map Natural Resources and Environmental Sciences (Version – Nov. 1, 2018)		PSLO	PSLO	PSLO	PSLO		
		1	2	3	4		
UK CORE	GEN 100 Issues in Agriculture	----	I	I	I		
	STA 296 Statistical Method and motivations	I	----	----	----		
	MA 123 Elementary Calculus and Its Applications (or MA109)	I	----	----	----		
	CHE 105 General College Chemistry I	----	----	I	----		
	CHE 111 Laboratory to Accompany General Chemistry I	I	----	I	I		
Pre-major Requirements	BIO 148 Principles of Biology I	I	----	I	----		
	BIO 152 Principles of Biology II	I	----	I	----		
	ECO 201 Principles in Economics I	----	I	I	----		
	EES 220 Principles of Physical Geology	----		I			
Major Requirements	Sophomore	NRE 201 Natural Resources and Environmental Science		I/E	E	I/E	
		FOR 435 Conservation Biology	I/E	I/E	E	E	
		PHI 336 Forestry and Natural Resource Ethics	I/E	I/E	E	E	
		NRE 381 Natural Resource and Environmental Policy Analysis	----	I	E	E	
		NRE 355 Geographic Information Systems and Landscape Analysis	----	----	E	E	
	Junior	NRE 320 Natural Resource and Environmental Analysis	----	I	E	E/R	
		PLS 366 Fundamentals of Soil Science	E/R	----	E	E	
		AEC 445G Introduction to Resource and Environmental Economics	----	I	E/R	E	
		AEC 326 Principles of Environmental Law	----	I/E	R	E	
		FOR 340 Forest Ecology	E/R	----	E	E	
		FOR 325 Economic Botany: Plants and Human Affairs		I/E	E	E	
		Senior	FOR 460 Forest Hydrology and Watershed Management	E	E	E	E/R
			NRE 471 Senior Problem in Natural Resources and Environmental Science	R	R	R	R
			NRE 395 Independent Study in Natural Resources and Environmental Science	varies	varies	varies	E
			NRE 399 Experiential Ed. in Natural Resources and Environmental Science	varies	varies	varies	E

Key:

Introduced	Introduced/Emphasized	Emphasized	Emphasized/Reinforced	Reinforced
------------	-----------------------	------------	-----------------------	------------



5. Assessment Methods and Measures

5.1 Artifacts used for **FORMATIVE ASSESSMENT**

Learning Outcomes **ARTIFACT** Map

Natural Resources and Environmental Sciences


(Version – May 1, 2018)

* - indicates in which course a potential artifact can be collected for assessing the LO

		LO1	LO 2	LO 3	LO 4	
		2020-2021	2021-2022	2022-2023	2023-2024	
UK CORE	GEN 100 Issues in Agriculture					
	STA 296 Statistical Method and motivations		----	----	----	
	MA 123/109 Elementary Calculus and Its Applications	----	----	----	----	
	CHE 105 General College Chemistry I	----	----		----	
	CHE 111 Laboratory to Accompany General Chemistry I		----		----	
Pre-major Requirements	BIO 148 Principles of Biology I		----		----	
	BIO 152 Principles of Biology II		----		----	
	ECO 201 Principles in Economics I	----			----	
	EES 220 Principles of Physical Geology	----			----	
Major Requirements	Sophomore	NRE 201 Natural Resources and Environmental Science	----	*		*
		FOR 435 Conservation Biology	----	*		----
		FOR 240 Forestry and Natural Resource Ethics	----			----
		NRE 381 Natural Resource and Environmental Policy Analysis	----	*		----
		NRE 355 Geographic Information Systems and Landscape Analysis	----	----		----
	NRE 320 Natural Resource and Environmental Analysis	----				
	Junior	PLS 366 Fundamentals of Soil Science	**	----	*	----
		AEC 445G Introduction to Resource and Environmental Economics	----	*	*	----
		AEC 326 Principles of Environmental Law	----	*	*	----
		FOR 340 Forest Ecology		----		*
		FOR 325 Economic Botany: Plants and Human Affairs	----			----
	Senior	FOR 460 Forest Hydrology and Watershed Management	----			*
		NRE 471 Senior Problem in Natural Resources and Environmental Science	**	*	*	*
		NRE 395 Independent Study in Natural Resources and Environmental Science	----	----	----	*
	NRE 399 Experiential Ed. in Natural Resources and Environmental Science	----	----	----	*	

Key:

Introduced	Introduced/Emphasized	Emphasized	Emphasized/Reinforced	Reinforced
------------	-----------------------	------------	-----------------------	------------



5.2. Artifacts used for **SUMMATIVE ASSESSMENT** (collected annually):

- | | |
|--|-------------------------------|
| 1. Senior Capstone (NRE471) Survey (Appendix A) | 4. Years to degree completion |
| 2. Internship Forum Survey (Appendix B) | 5. Average graduated GPA |
| 3. Online Senior Exit Survey (Appendix C) | 6. Matriculation rates |

6. Data Collection and Review

6.1. Data Collection Process/Procedures

Artifacts for assessment will be collected from courses indicated in the artifact map (section 5.1) and detailed in table 6.2 below. Timing of artifact collection will depend on when they are completed in the respective course they are being drawn from. A detailed timetable of when the artifacts will be completed for each course will be constructed from course syllabi by the NRES academic coordinator who will then be responsible for contacting the course instructor and arranging how the artifact will be collected (i.e. electronic, hard copy).

6.2. Detailed Artifact Map

Learning Outcomes	Detailed Artifact Description
<p>1. Students will <u>demonstrate proper data collection methods and analysis techniques in field and laboratory settings to solve fundamental and quantitative problems involving contemporary and emerging, local, regional and/or global natural resource and environmental issues.</u></p>	<p>CHEM 111 Laboratory for General College Chemistry: Final lab score PLS 366 Fundamentals of Soil Science: Soil microbiology lab – involves an experiment on microbial respiration, interpretation of reaction stoichiometry and the calculation of CO₂-C evolution.</p>
	<p>EES220 Principles in Physical Geology: an integrated course in physical geology, covering the physical, chemical and biological processes that combine to produce geological processes. Attention is focused on plate tectonics, earth surface processes, and properties and formation of earth materials. Lab exercises emphasize identification and interpretation of geologic materials and maps. FOR460 Opinion and/or Review Paper: four-page (double spaced) (12 pt. font) position paper on whether or not the EPAs conductivity rule is fair. Use information from the literature to justify (support) your position. Given that this is a “Watershed Management” class, identify potential impacts that the adoption or dismissal of this guidance rule could have on water resources</p>
	<p>STA 296 Statistical Methods and Motivations: Homework assignment focused on the application of statistical principles for the analysis and interpretation of data. PLS366 Bulk Density and Water Lab: A lab report in which students have to collected bulk density and infiltration measurements from field sites, perform calculations, make graphics, interpret data, and make recommendations NRE471 Senior Problems in NRES: Survey and Final Report</p>
<p>2. Students will be able to <u>integrate principles of human systems such as those found in history, law, public policy, ethics, and economics, to address natural resource and environmental issues.</u></p>	<p>FOR 435 Conservation Biology: Short writing assignment: typically short (10-15 minute) in-class writing periods to think and write about a particular question(s) or problem(s) presented in the reading or other assignment, and/or from that day’s lecture and discussion material. These will be graded more on the quality (clarity, thoughtfulness, logic, etc.) of your response and overall effort then on other grammatical criteria given the short time limit. You may be called on some occasions to discuss and defend your answers in class. AEC 445G Introduction to Resource and Environmental Economics: Case Studies: integrate the key concepts and analytical tools and apply them to understanding a real-life environmental issue. For each assigned case, students will conduct some economics analysis based on a model provided and also write a report, which should be typed and about 4-5 pages long (double-spaced). For each assigned case, student is also responsible for leading the discussion during class. AEC 326 Principles of Environmental Law: Case studies NRE471 Senior Problems in NRES: Survey and Final Report</p>

*continued on next page

Learning Outcomes	Detailed Artifact Description
<p><i>3. Students will demonstrate their ability to <u>draw conclusions and make recommendations based on an interdisciplinary understanding of natural and human systems principles and perspectives.</u></i></p>	<p>PLS 366 Fundamentals of Soil Science: Land Use Project - AEC 326 Principles of Environmental Law: Case studies NRE/LA 355 Introductory GIS for Land Analysis: Final Project: Students will work independently to identify a Kentucky or Bluegrass research question or problem and implement a GIS to achieve a research objective. Students will demonstrate competencies in areas of data acquisition and transformation, spatial analysis, and cartographic representation. The project consists of three major components: FOR 460 Forest Watershed Management: Team Project (group of 5) written report. You will make a determination on whether or not the water quality is impaired. You will evaluate the geomorphology of the stream. Subsequently, you will be responsible for writing a technical report pertaining to your findings. The report should indicate how the stream segment functions from a stream continuum perspective, how land management procedures within the watersheds have contributed to the results obtained, and how the conditions may influence downstream segments. Finally, you should make some recommendations on how to better manage these areas (BMPs), and/or make suggestions that would improve the current conditions from an ecological, environmental, social or economic standpoint.</p>
<p><i>4. (GCCR) Students will demonstrate their ability to <u>function as part of a multidisciplinary team</u> and be able to <u>effectively communicate natural resource and environmental issues</u> in written, oral, and visual formats to professionals and community stakeholders.</i></p>	<p>NRE 395 Independent Study in NRES - A research paper (4500 word minimum, double-spaced, 12 pt font, 1 inch margins) will be prepared based on the results of the research conducted/project undertaken and integrate elements of your ASD and/or ESEA. Data and results can be presented in tables and/or figures as appropriate. The title page, acknowledgments, and references do not count towards the 4500 word minimum. NRE 399 Experiential Ed. In NRES - You have the option of writing either a 1) white paper, 2) project report, or 3) another written document agreed upon with your faculty sponsor. The written paper has to be a minimum of 4500 words and integrate elements of your ASD and/or ESEA with the internship. NOTE: see NRE399 and NRE395 Syllabi in Appendix H for more details on GCCR assessment</p> <p>FOR460 Forest watershed management: Team project (group of 5) – <u>Peer evaluation</u> NRE471 Senior Problems in NRES: Survey administered to faculty, students and invited stakeholders. Final written report. <u>Peer evaluation</u></p>

7. Assessment Cycle and Data Analysis

Artifacts will be evaluated in **August** of each year by the NRES assessment sub-committee following the area value rubrics provided in Appendices D-K (under construction). Each value rubric is based on a scale of 0 to 4, with 4 being assigned to artifacts that demonstrate full attainment of the learning outcome. Results will be analyzed and interpreted by the NRES assessment subcommittee chair (McNear) and shared in **September** with the remainder of the subcommittee for review and comment. The SLO report will then be finalized and submitted at the beginning of **October** to the CAFÉ assessment coordinator (Dr. Larry Grabau) with the final report being submitted to the University's assessment office no later than **October 31st**.

7.1 Assessment Cycle

Outcome Number	Stated Student Learning Outcome	Cycle	Academic Year	Reporting Year
1	Students will demonstrate proper data collection methods and analysis techniques in field and laboratory settings to solve fundamental and quantitative problems involving contemporary and emerging, local, regional and/or global natural resource and environmental issues.	Year 1	2018-2019	Oct. 31, 2019
2	Students will be able to integrate principles of human systems such as those found in history, law, public policy, ethics, and economics, to address contemporary and emerging, local, regional and/or global natural resource and environmental issues.	Year 2	2019-2020	Oct. 31, 2020
3	Students will demonstrate their ability to draw conclusions and make recommendations based on an interdisciplinary understanding of contemporary and emerging, local, regional and/or global natural and human systems principles and perspectives.	Year 3	2021-2022	Oct. 31, 2021
4 *GCCR*	(GCCR) Students will demonstrate their ability to function as part of a multidisciplinary team and be able to effectively communicate natural resource and environmental issues in written, oral, and visual formats to professionals and community stakeholders.	All Years	All Years	Oct. 31, 2019, 2020,2021

8. Teaching Effectiveness

8.1. Identify measures of teaching effectiveness

Student course evaluations are used by the University to provide students the opportunity to evaluate all courses and instructors. The information will be collated by the Director of Undergraduate Studies (Dr. David McNear) for the NRES major to provide ongoing assessment of the quality of the major courses in the curriculum.

8.2. What efforts to improve teaching effectiveness will be pursued based on these measures?

Should the student course evaluations be below average (of the Department, College and/or University) then the instructor will be advised to work with individuals in the office of the Associate Dean for Research to identify

institutional and professional opportunities for instructional improvement. Working with Department chairs, periodic peer-review by NRES steering committee members or faculty within the instructors department will also be used to monitor progress and provide constructive feedback on instructor performance.

9. What are the plans to evaluate students' post-graduate success?

The NRES program is actively engaged in several activities for the evaluation of post-graduate success. The program produces a biannual newsletter in which we highlight one or several graduates from our program that have gone on to successful careers in natural resource related fields. Working with the UK Alumni association we have compiled the names and last known contact information for many alumni of the NRES (and former NRCM) programs have or will use to gauge post-graduate success. We have also employed current NRES students to improve and increase the NRES web presence via Facebook, LinkedIn, Instagram, etc. providing another point of contact and forum on which to evaluate post-graduate success.

10. Appendices

10.1 Appendix A – Senior Capstone (NRE471) survey

Senior Capstone Presentation, Project Evaluation Form, NRE 471, April, 2014

First, please tell us why you are here.

___ I am a guest specifically invited to be present at this event.

___ I am a student in NRC 301, required by my instructor to come for this event.

___ I am here for other reasons—if so, please specify: _____

Next, please respond to each of the items below by circling the letter corresponding to your evaluation of the group's work in each category. Use the following rankings—"E" for exceptional, "G" for good, "F" for fair, and "M" for marginal. If you are not in a position to make an evaluation for a given item, please circle "NE", meaning "not evaluated."

- | | | | | | |
|--|---|---|---|---|----|
| 1. The team clearly communicated the purpose of its project. | E | G | F | M | NE |
| 2. The speakers were effective and engaging. | E | G | F | M | NE |
| 3. The slides were clear, crisp, and contributed to the flow of the presentation. | E | G | F | M | NE |
| 4. The flow of the presentation was easy to follow. | E | G | F | M | NE |
| 5. The recommendations were well-supported by the research presented by the team. | E | G | F | M | NE |
| 6. The students demonstrated a good grasp of the underlying science and policy issues. | E | G | F | M | NE |
| 7. In my opinion, the team's recommendations stand a good chance of being implemented. | E | G | F | M | NE |
| 8. Students' answers to questions showed a good grasp of the underlying issues. | E | G | F | M | NE |

Please turn this form over for more items.

9. The students applied principles of chemical, biological, and physical systems to address natural resource and environmental issues.

E G F M NE

10. The students applied human systems principles such as those found in history, law, public policy, ethics, and economics to address natural resource and environmental issues.

E G F M NE

11. The students demonstrated the safe and proper use of data collection techniques and methods in field and laboratory settings and conducted related analyses.

E G F M NE

12. The students effectively communicated natural resource and environmental issues in written, oral, and visual formats to professionals and community stakeholders.

E G F M NE

13. The students demonstrated 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.

E G F M NE

Finally, please note your comments about the presentation or the project itself below.

Thank you for attending this presentation, and thank you very much for completing this evaluation form! Please enjoy some refreshments and conversation with us before leaving.



2013 INTERNSHIP FORUM SURVEY FACULTY AND STAFF

Poster # _____

1. The student verbally presented their poster in a professional manner and effectively conveyed the purpose of their internship/research project.

Strongly disagree	Disagree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

2. NRCM- Internship/research project is closely aligned with a concentration area, or NRES- Internship/research project is closely aligned with a relevant ASDA or ESEA.
Analytical Skill Development Area (Economic and Policy Analysis, Field and Laboratory Analysis of Ecosystems, Geospatial Analysis, or Individualized Area)
Environmental System Emphasis Area (Conservation Biology, Forestry, Human Dimensions and Natural Resource Planning, Environmental Soil Science, Water Resources, Wildlife Management, or Individualized Area)

Strongly disagree	Disagree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

3. Poster presentation is visually accessible and appealing. It draws the reader to it, uses photos and/or other visuals.

Strongly disagree	Disagree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. Written component of the poster is engaging and well written without editorial mistakes.

Strongly disagree	Disagree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. Written component clearly states the goals and accomplishments of the internship or research project.

Strongly disagree	Disagree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. The poster clearly identifies the author, location of internship/research project, and organization/contact person.

Strongly disagree	Disagree	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NRES Graduate Survey 2015

***1. When did you, or will you, graduate?**

- August 2014
- December 2014
- May 2015
- Other

Please specify

***2. Were you NRES or NRCM?**

- NRES (Natural Resources and Environmental Science)
- NRCM (Natural Resources and Conservation Management)

***3. What was your Analytical Skill Development Area (ASD)?**

- Economic and Policy Analysis
- Environmental Education
- Field and Laboratory Analysis of Ecosystems
- Geospatial Analysis
- Individualized (please specify below)

Individualized Analytical Skill Development Area

***4. What was your Environmental Systems Emphasis Area (ESEA)?**

- Conservation Biology
- Earth Systems Science
- Forestry
- Global Sustainable Food Systems
- Human Dimensions and Natural Resource Planning
- Soil Science
- Water Resources
- Wildlife Management
- Individualized (please specify below)

Individualized Environmental Systems Emphasis Area

NRES Graduate Survey 2015

*** 5. How did you become aware of the NRES major? (Website, advisor, classmate, friend, etc.)**

*** 6. What made you choose the NRES major?**

7. Did you...

- Start NRES as a freshmen
- Transfer to NRES from another UK major
- Transfer to NRES from another University

If you transferred, please state where from:

8. Please reflect on whether or not you think your choice to major in NRES was a good decision.

9. Would you recommend NRES major to other students? Why/Why not?

- Yes
- No

Why/Why not?

10. Have you recommended the major to other students?

- Yes
- No

NRES Graduate Survey 2015

*** 11. Please rate the following NRES related courses on a 1-to-4 scale (1 = Excellent; 4 = Poor; N/A = did not take this class)**

	Excellent	Good	Fair	Poor	N/A
NRE 301: Natural Resources & Environmental Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRE 320: Data Collection Techniques (Summer Camp)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRE 355/555/LA855: Geographic Information Systems and Landscape Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRE 381: Natural Resource Policy Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRE 395: Independent Study in Natural Resources (Independent Research Project)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRE 399: Experiential Education in Natural Resources (Internship)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
NRE 471: Senior Problem In Natural Resources (Capstone)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AEC 424: Principles of Environmental Law	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AEC 445G: Introduction to Resource and Environmental Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AEC 545: Resource and Environmental Economics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOR 230: Conservation Biology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOR 325: Economic Botany	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOR 340: Forest Ecology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
FOR 460G: Forest Watershed Management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GLY 385: Groundwater Hydrology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PLS 366: Fundamentals of Soil Science	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall quality of Instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

NRES Graduate Survey 2015

12. Any comments about the above courses? (Including quality of instruction, content of courses, variety of courses)

13. What were the two most beneficial courses you completed? Why?

14. What were the two least beneficial courses you completed? Why?

15. Are there courses not currently offered at UK that you think should be part of the NRES curriculum? Please describe.

16. Which summer camp did you attend?

- Robinson Forest 2011
- Robinson Forest 2012
- Robinson Forest 2013
- Robinson Forest 2014
- Costa Rica 2013
- Costa Rica 2014

Other (please specify)

NRES Graduate Survey 2015

17. How do you describe the overall value of the NRES Summer Camp experience?

- Excellent
- Good
- Fair
- Poor
- NA - I did not take NRES Summer Camp

Was there a particular module(s) that you especially valued?

18. What would you do to improve the Summer Camp experience?

19. When and where did you do your internship and/or research project? Please comment on your internship/research experience and the Internship Forum.

20. Have you had problems with scheduling NRES courses or other required courses?

- Yes
- No

If yes, please explain in more detail.

NRES Graduate Survey 2015

21. How do you describe the NRES curriculum? (i.e., Challenging? Good prep for grad school? Good prep for an environmental career?)

22. If you could change one thing about the NRES curriculum, what would it be?

23. How would you rate your overall quality of advising?

Excellent

Good

Fair

Poor

Who was your advisor?

***24. Did you study abroad while at the University of Kentucky?**

Yes

No

25. If you did study abroad then:

How long did you go abroad? (summer, semester, year)

Where did you go abroad?

What type of program was it? (internship, research, study, etc)

What did you study?

26. Do you wish you had studied abroad?

Yes

No

I did study abroad

NRES Graduate Survey 2015

27. If you would have liked to study abroad, what world regions would you have been interested in? (check all that apply)

- Africa
- Asia
- Australia/Oceania
- Europe
- South America
- North America (Canada)

Other (please specify)

28. If you did not study abroad but wanted to, what kept you from going? (Cost, access, knowledge of programs, availability of programs, etc)

29. As your undergraduate years near completion, what are your plans following graduation?

***30. Do you anticipate going directly into the workforce after graduation?**

- Yes
- No

Other (please specify)

31. If you answered yes to the above item, do you anticipate the employment being related to NRES?

- Yes
- No

NRES Graduate Survey 2015

***32. Do you intend to go to graduate or professional school after graduation?**

Yes

No

If yes or maybe later, please note your intended degree and school(s).

33. What influenced your decision whether or not to pursue further education?

34. Where do you see yourself five years from now? Ten years?

35. Is there anything else you would like the NRES Steering Committee to know about your undergraduate experience at UK? Please explain in sufficient detail so that, if possible, we can replicate the positives and minimize the negatives for future students.

NRES Graduate Survey 2015

***36. Based on your own experience and the experience of your peers in the NRES program, assess the general level of learning in each of the five program goals below. (Note that this applies to the program as a whole, not to an individual course experience.)**

	Excellent	Good	Fair	Marginal
Students applied principles of chemical, biological, and physical systems to address natural resource and environmental issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students applied human systems principles such as those found in history, law, public policy, ethics, and economics to address natural resource and environmental issues.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students demonstrated the safe and proper use of data collection techniques and methods in field and laboratory settings and conducted related analyses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students effectively communicated natural resource and environmental issues in written, oral, and visual formats to professionals and community stakeholders.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Students demonstrated 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.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

You are done!

Thank you for your participation in the NRES Graduate Survey!

Please keep us updated with your current mailing and email address.

10.4 Appendix C – NRE 395/NRE399

QUANTITATIVE LITERACY VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a "habit of mind," competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Quantitative Literacy Across the Disciplines

Current trends in general education reform demonstrate that faculty are recognizing the steadily growing importance of Quantitative Literacy (QL) in an increasingly quantitative and data-dense world. AAC&U's recent survey showed that concerns about QL skills are shared by employers, who recognize that many of today's students will need a wide range of high level quantitative skills to complete their work responsibilities. Virtually all of today's students, regardless of career choice, will need basic QL skills such as the ability to draw information from charts, graphs, and geometric figures, and the ability to accurately complete straightforward estimations and calculations.

Preliminary efforts to find student work products which demonstrate QL skills proved a challenge in this rubric creation process. It's possible to find pages of mathematical problems, but what those problem sets don't demonstrate is whether the student was able to think about and understand the meaning of her work. It's possible to find research papers that include quantitative information, but those papers often don't provide evidence that allows the evaluator to see how much of the thinking was done by the original source (often carefully cited in the paper) and how much was done by the student herself, or whether conclusions drawn from analysis of the source material are even accurate.

Given widespread agreement about the importance of QL, it becomes incumbent on faculty to develop new kinds of assignments which give students substantive, contextualized experience in using such skills as analyzing quantitative information, representing quantitative information in appropriate forms, completing calculations to answer meaningful questions, making judgments based on quantitative data and communicating the results of that work for various purposes and audiences. As students gain experience with those skills, faculty must develop assignments that require students to create work products which reveal their thought processes and demonstrate the range of their QL skills.

This rubric provides for faculty a definition for QL and a rubric describing four levels of QL achievement which might be observed in work products within work samples or collections of work. Members of AAC&U's rubric development team for QL hope that these materials will aid in the assessment of QL – but, equally important, we hope that they will help institutions and individuals in the effort to more thoroughly embed QL across the curriculum of colleges and universities.

Framing Language

This rubric has been designed for the evaluation of work that addresses quantitative literacy (QL) in a substantive way. QL is not just computation, not just the citing of someone else's data. QL is a habit of mind, a way of thinking about the world that relies on data and on the mathematical analysis of data to make connections and draw conclusions. Teaching QL requires us to design assignments that address authentic, data-based problems. Such assignments may call for the traditional written paper, but we can imagine other alternatives: a video of a PowerPoint presentation, perhaps, or a well designed series of web pages. In any case, a successful demonstration of QL will place the mathematical work in the context of a full and robust discussion of the underlying issues addressed by the assignment.

Finally, QL skills can be applied to a wide array of problems of varying difficulty, confounding the use of this rubric. For example, the same student might demonstrate high levels of QL achievement when working on a simplistic problem and low levels of QL achievement when working on a very complex problem. Thus, to accurately assess a student's QL achievement it may be necessary to measure QL achievement within the context of problem complexity, much as is done in diving competitions where two scores are given, one for the difficulty of the dive, and the other for the skill in accomplishing the dive. In this context, that would mean giving one score for the complexity of the problem and another score for the QL achievement in solving the problem.

QUANTITATIVE LITERACY VALUE RUBRIC

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Definition

Quantitative Literacy (QL) – also known as Numeracy or Quantitative Reasoning (QR) – is a "habit of mind," competency, and comfort in working with numerical data. Individuals with strong QL skills possess the ability to reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. They understand and can create sophisticated arguments supported by quantitative evidence and they can clearly communicate those arguments in a variety of formats (using words, tables, graphs, mathematical equations, etc., as appropriate).

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		1
		3	2	
Interpretation <i>Ability to explain information presented in mathematical forms (e.g., equations, graphs, diagrams, tables, words).</i>	Provides accurate explanations of information presented in mathematical forms. Makes appropriate inferences based on that information. <i>For example, accurately explain the trend data shown in a graph and make reasonable predictions regarding what the data suggest about future events.</i>	Provides accurate explanations of information presented in mathematical forms. <i>For instance, accurately explain the trend data shown in a graph.</i>	Provides somewhat accurate explanations of information presented in mathematical forms, but occasionally makes minor errors related to computations or units. <i>For instance, accurately explain trend data shown in a graph, but may miscalculate the slope of the trend line.</i>	Attempts to explain information presented in mathematical forms, but draws incorrect conclusions about what the information means. <i>For example, attempts to explain the trend data shown in a graph, but will frequently misinterpret the nature of that trend, perhaps by confusing positive and negative trends.</i>
Representation <i>Ability to convert relevant information into various mathematical forms (e.g., equations, graphs, diagrams, tables, words).</i>	Skillfully converts relevant information into an insightful mathematical portrayal in a way that contributes to a further or deeper understanding.	Competently converts relevant information into an appropriate and desired mathematical portrayal.	Completes conversion of information but resulting mathematical portrayal is only partially appropriate or accurate.	Completes conversion of information but resulting mathematical portrayal is inappropriate or inaccurate.
Calculation	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem. Calculations are also presented elegantly (clearly, concisely, etc.)	Calculations attempted are essentially all successful and sufficiently comprehensive to solve the problem.	Calculations attempted are either unsuccessful or represent only a portion of the calculations required to comprehensively solve the problem.	Calculations are attempted but are both unsuccessful and are not comprehensive.
Application / Analysis <i>Ability to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.</i>	Uses the quantitative analysis of data as the basis for deep and thoughtful judgments, drawing insightful, carefully qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for competent judgments, drawing reasonable and appropriately qualified conclusions from this work.	Uses the quantitative analysis of data as the basis for workmanlike (without inspiration or nuance, ordinary) judgments, drawing plausible conclusions from this work.	Uses the quantitative analysis of data as the basis for tentative, basic judgments, although is hesitant or uncertain about drawing conclusions from this work.
Assumptions <i>Ability to make and evaluate important assumptions in estimation, modeling, and data analysis.</i>	Explicitly describes assumptions and provides compelling rationale for why each assumption is appropriate. Shows awareness that confidence in final conclusions is limited by the accuracy of the assumptions.	Explicitly describes assumptions and provides compelling rationale for why assumptions are appropriate.	Explicitly describes assumptions.	Attempts to describe assumptions.
Communication <i>Expressing quantitative evidence in support of the argument or purpose of the work (in terms of what evidence is used and how it is formatted, presented, and contextualized).</i>	Uses quantitative information in connection with the argument or purpose of the work, presents it in an effective format, and explicates it with consistently high quality.	Uses quantitative information in connection with the argument or purpose of the work, though data may be presented in a less than completely effective format or some parts of the explication may be uneven.	Uses quantitative information, but does not effectively connect it to the argument or purpose of the work.	Presents an argument for which quantitative evidence is pertinent, but does not provide adequate explicit numerical support. (May use quasi-quantitative words such as "many," "few," "increasing," "small," and the like in place of actual quantities.)

PROBLEM SOLVING VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

Problem solving is the process of designing, evaluating and implementing a strategy to answer an open-ended question or achieve a desired goal.

Framing Language

Problem-solving covers a wide range of activities that may vary significantly across disciplines. Activities that encompass problem-solving by students may involve problems that range from well-defined to ambiguous in a simulated or laboratory context, or in real-world settings. This rubric distills the common elements of most problem-solving contexts and is designed to function across all disciplines. It is broad-based enough to allow for individual differences among learners, yet is concise and descriptive in its scope to determine how well students have maximized their respective abilities to practice thinking through problems in order to reach solutions.

This rubric is designed to measure the quality of a **process**, rather than the quality of an **end-product**. As a result, work samples or collections of work will need to include some evidence of the individual's thinking about a problem-solving task (e.g., reflections on the process from problem to proposed solution; steps in a problem-based learning assignment; record of think-aloud protocol while solving a problem). The final product of an assignment that required problem resolution is insufficient without insight into the student's problem-solving process. Because the focus is on institutional level assessment, scoring team projects, such as those developed in capstone courses, may be appropriate as well.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Contextual Factors:** Constraints (such as limits on cost), resources, attitudes (such as biases) and desired additional knowledge which affect how the problem can be best solved in the real world or simulated setting
- **Critique:** Involves analysis and synthesis of a full range of perspectives.
- **Feasible:** Workable, in consideration of time-frame, functionality, available resources, necessary buy-in, and limits of the assignment or task.
- **"Off the shelf" solution:** A simplistic option that is familiar from everyday experience but not tailored to the problem at hand (e.g. holding a bake sale to "save" an underfunded public library).
- **Solution:** An appropriate response to a challenge or a problem.
- **Strategy:** A plan of action or an approach designed to arrive at a solution. (If the problem is a river that needs to be crossed, there could be a construction-oriented, cooperative (build a bridge with your community) approach and a personally-oriented, physical (swim across alone) approach. An approach that partially applies would be a personal, physical approach for someone who doesn't know how to swim.
- **Support:** Specific rationale, evidence, etc. for solution or selection of solution.

PROBLEM SOLVING VALUE RUBRIC

for more information, please contact value@aacu.org



Definition

Problem solving is the process of designing, evaluating and implementing a strategy to answer an open-ended question or achieve a desired goal.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Define problem	Demonstrates the ability to construct a clear and insightful problem statement with evidence of all relevant contextual factors.	Demonstrates the ability to construct a problem statement with evidence of most relevant contextual factors, and problem statement is adequately detailed.	Begins to demonstrate the ability to construct a problem statement with evidence of most relevant contextual factors, but problem statement is superficial.	Demonstrates a limited ability in identifying a problem statement or related contextual factors.
Identify strategies	Identifies multiple approaches for solving the problem that apply within a specific context.	Identifies multiple approaches for solving the problem, only some of which apply within a specific context.	Identifies only a single approach for solving the problem that does apply within a specific context.	Identifies one or more approaches for solving the problem that do not apply within a specific context.
Propose solutions/hypotheses	Proposes one or more solutions/hypotheses that indicates a deep comprehension of the problem. Solution/hypotheses are sensitive to contextual factors as well as all of the following: ethical, logical, and cultural dimensions of the problem.	Proposes one or more solutions/hypotheses that indicates comprehension of the problem. Solutions/hypotheses are sensitive to contextual factors as well as the one of the following: ethical, logical, or cultural dimensions of the problem.	Proposes one solution/hypothesis that is "off the shelf" rather than individually designed to address the specific contextual factors of the problem.	Proposes a solution/hypothesis that is difficult to evaluate because it is vague or only indirectly addresses the problem statement.
Evaluate potential solutions	Evaluation of solutions is deep and elegant (for example contains thorough and insightful explanation) includes, deeply and thoroughly, all of the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution and weighs impacts of solution.	Evaluation of solutions is adequate (for example contains thorough explanation) and includes the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution and weighs impacts of solution.	Evaluation of solutions is brief (for example explanation lacks depth) and includes the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution and weighs impacts of solution.	Evaluation of solutions is superficial (for example, contains cursory, surface level explanation) and includes the following: considers history of problem, reviews logic/reasoning, examines feasibility of solution and weighs impacts of solution.
Implement Solution	Implements the solution in a manner that addresses thoroughly and deeply multiple contextual factors of the problem.	Implements the solution in a manner that addresses multiple contextual factors of the problem in a surface manner.	Implements the solution in a manner that addresses the problem statement but ignores relevant contextual factors.	Implements the solution in a manner that does not directly address the problem statement.
Evaluate outcomes	Reviews results relative to the problem defined with thorough, specific considerations of need for further work.	Reviews results relative to the problem defined with some consideration of need for further work.	Reviews results in terms of the problem defined with little, if any consideration of need for further work.	Reviews results superficially in terms of the problem defined with no consideration of need for further work.

ETHICAL REASONING VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

Ethical Reasoning is reasoning about right and wrong human conduct. It requires students to be able to assess their own ethical values and the social context of problems, recognize ethical issues in a variety of settings, think about how different ethical perspectives might be applied to ethical dilemmas and consider the ramifications of alternative actions. Students' ethical self identity evolves as they practice ethical decision-making skills and learn how to describe and analyze positions on ethical issues.

Framing Language

This rubric is intended to help faculty evaluate work samples and collections of work that demonstrate student learning about ethics. Although the goal of a liberal education should be to help students turn what they've learned in the classroom into action, pragmatically it would be difficult, if not impossible, to judge whether or not students would act ethically when faced with real ethical situations. What can be evaluated using a rubric is whether students have the intellectual tools to make ethical choices.

The rubric focuses on five elements: Ethical Self Awareness, Ethical Issue Recognition, Understanding Different Ethical Perspectives/Concepts, Application of Ethical Principles, and Evaluation of Different Ethical Perspectives/Concepts. Students' Ethical Self Identity evolves as they practice ethical decision-making skills and learn how to describe and analyze positions on ethical issues. Presumably, they will choose ethical actions when faced with ethical issues.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Core Beliefs:** Those fundamental principles that consciously or unconsciously influence one's ethical conduct and ethical thinking. Even when unacknowledged, core beliefs shape one's responses. Core beliefs can reflect one's environment, religion, culture or training. A person may or may not choose to act on their core beliefs.
- **Ethical Perspectives/concepts:** The different theoretical means through which ethical issues are analyzed, such as ethical theories (e.g., utilitarian, natural law, virtue) or ethical concepts (e.g., rights, justice, duty).
- **Complex, multi-layered (grey) context:** The sub-parts or situational conditions of a scenario that bring two or more ethical dilemmas (issues) into the mix/problem/context/for student's identification.
- **Cross-relationships among the issues:** Obvious or subtle connections between/among the sub-parts or situational conditions of the issues present in a scenario (e.g., relationship of production of corn as part of climate change issue).

ETHICAL REASONING VALUE RUBRIC

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Definition

Ethical Reasoning is reasoning about right and wrong human conduct. It requires students to be able to assess their own ethical values and the social context of problems, recognize ethical issues in a variety of settings, think about how different ethical perspectives might be applied to ethical dilemmas and consider the ramifications of alternative actions. Students' ethical self identity evolves as they practice ethical decision-making skills and learn how to describe and analyze positions on ethical issues.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Ethical Self Awareness	Student discusses in detail/analyzes both core beliefs and the origins of the core beliefs and discussion has greater depth and clarity.	Student discusses in detail/analyzes both core beliefs and the origins of the core beliefs.	Student states both core beliefs and the origins of the core beliefs.	Student states either their core beliefs or articulates the origins of the core beliefs but not both.
Understanding Different Ethical Perspectives/Concepts	Student names the theory or theories, can present the gist of said theory or theories, and accurately explains the details of the theory or theories used.	Student can name the major theory or theories she/he uses, can present the gist of said theory or theories, and attempts to explain the details of the theory or theories used, but has some inaccuracies.	Student can name the major theory she/he uses, and is only able to present the gist of the named theory.	Student only names the major theory she/he uses.
Ethical Issue Recognition	Student can recognize ethical issues when presented in a complex, multi-layered (grey) context AND can recognize cross-relationships among the issues.	Student can recognize ethical issues when issues are presented in a complex, multi-layered (grey) context OR can grasp cross-relationships among the issues.	Student can recognize basic and obvious ethical issues and grasp (incompletely) the complexities or inter-relationships among the issues.	Student can recognize basic and obvious ethical issues but fails to grasp complexity or inter-relationships.
Application of Ethical Perspectives/Concepts	Student can independently apply ethical perspectives/concepts to an ethical question, accurately, and is able to consider full implications of the application.	Student can independently (to a new example) apply ethical perspectives/concepts to an ethical question, accurately, but does not consider the specific implications of the application.	Student can apply ethical perspectives/concepts to an ethical question, independently (to a new example) and the application is inaccurate.	Student can apply ethical perspectives/concepts to an ethical question with support (using examples, in a class, in a group, or a fixed-choice setting) but is unable to apply ethical perspectives/concepts independently (to a new example).
Evaluation of Different Ethical Perspectives/Concepts	Student states a position and can state the objections to, assumptions and implications of and can reasonably defend against the objections to, assumptions and implications of different ethical perspectives/concepts and the student's defense is adequate and effective.	Student states a position and can state the objections to, assumptions and implications and respond to the objections to, assumptions and implications of different ethical perspectives/concepts but the student's response is inadequate.	Student states a position and can state the objections to, assumptions and implications of different ethical perspectives/concepts but does not respond to them (and ultimately objections, assumptions and implications are compartmentalized by student and do not affect student's position.)	Student states a position but cannot state the objections to and assumptions and limitations of the different perspectives/concepts.

INQUIRY AND ANALYSIS VALUE RUBRIC

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Definition

Inquiry is a systematic process of exploring issues, objects or works through the collection and analysis of evidence that results in informed conclusions or judgments. Analysis is the process of breaking complex topics or issues into parts to gain a better understanding of them.

Framing Language

This rubric is designed for use in a wide variety of disciplines. Since the terminology and process of inquiry are discipline-specific, an effort has been made to use broad language which reflects multiple approaches and assignments while addressing the fundamental elements of sound inquiry and analysis (including topic selection, existing knowledge, design, analysis, etc.) The rubric language assumes that the inquiry and analysis process carried out by the student is appropriate for the discipline required. For example, if analysis using statistical methods is appropriate for the discipline then a student would be expected to use an appropriate statistical methodology for that analysis. If a student does not use a discipline-appropriate process for any criterion, that work should receive a performance rating of "1" or "0" for that criterion.

In addition, this rubric addresses the **products** of analysis and inquiry, not the **processes** themselves. The complexity of inquiry and analysis tasks is determined in part by how much information or guidance is provided to a student and how much the student constructs. The more the student constructs, the more complex the inquiry process. For this reason, while the rubric can be used if the assignments or purposes for work are unknown, it will work most effectively when those are known. Finally, faculty are encouraged to adapt the essence and language of each rubric criterion to the disciplinary or interdisciplinary context to which it is applied.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Conclusions:** A synthesis of key findings drawn from research/evidence.
- **Limitations:** Critique of the process or evidence.
- **Implications:** How inquiry results apply to a larger context or the real world.

INQUIRY AND ANALYSIS VALUE RUBRIC

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Definition

Inquiry is a systematic process of exploring issues/objects/works through the collection and analysis of evidence that result in informed conclusions/judgments. Analysis is the process of breaking complex topics or issues into parts to gain a better understanding of them.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Topic selection	Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.	Identifies a focused and manageable/actable topic that appropriately addresses relevant aspects of the topic.	Identifies a topic that while manageable/actable, is too narrowly focused and leaves out relevant aspects of the topic.	Identifies a topic that is far too general and wide-ranging as to be manageable and doable.
Existing knowledge, research, and/or views	Synthesizes in depth information from relevant sources representing various points of view/approaches.	Presents in depth information from relevant sources representing various points of view/approaches.	Presents information from relevant sources representing limited points of view/approaches.	Presents information from irrelevant sources representing limited points of view/approaches.
Design process	All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant sub-disciplines.	Critical elements of the methodology or theoretical framework are appropriately developed however more subtle elements are ignored or unaccounted for.	Critical elements of the methodology or theoretical framework are missing, incorrectly developed or unfocused.	Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.
Analysis	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	Organizes evidence to reveal important patterns, differences, or similarities related to focus.	Organizes evidence but the organization is not effective in revealing important patterns, differences or similarities.	Lists evidence but it is not organized and/or is unrelated to focus.
Conclusions	States a conclusion that is a logical extrapolation from the inquiry findings.	States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	States an ambiguous, illogical or unsupported conclusion from inquiry findings.
Limitations and implications	Insightfully discusses in detail relevant and supported limitations and implications	Discusses relevant and supported limitations and implications	Presents relevant and supported limitations and implications	Presents limitations and implications, but they are possibly irrelevant and unsupported

WRITTEN COMMUNICATION VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

Framing Language

This writing rubric is designed for use in a wide variety of educational institutions. The most clear finding to emerge from decades of research on writing assessment is that the best writing assessments are locally determined and sensitive to local context and mission. Users of this rubric should, in the end, consider making adaptations and additions that clearly link the language of the rubric to individual campus contexts.

This rubric focuses assessment on how specific written work samples or collections of work respond to specific contexts. The central question guiding the rubric is "How well does writing respond to the needs of audience(s) for the work?" In focusing on this question the rubric does not attend to other aspects of writing that are equally important: issues of writing process, writing strategies, writers' fluency with different modes of textual production or publication, or writer's growing engagement with writing and disciplinarity through the process of writing.

Evaluators using this rubric must have information about the assignments or purposes for writing guiding writers' work. Also recommended is including reflective work samples or collections of work that address such questions as: What decisions did the writer make about audience, purpose, and genre as s/he compiled the work in the portfolio? How are those choices evident in the writing -- in the content, organization and structure, reasoning, evidence, mechanical and surface conventions, and citational systems used in the writing? This will enable evaluators to have a clear sense of how writers understand the assignments and take it into consideration as they evaluate.

The first section of this rubric addresses the context and purpose for writing. A work sample or collections of work can convey the context and purpose for the writing tasks it showcases by including the writing assignments associated with work samples. But writers may also convey the context and purpose for their writing within the texts. It is important for faculty and institutions to include directions for students about how they should represent their writing contexts and purposes.

Faculty interested in the research on writing assessment that has guided our work here can consult the National Council of Teachers of English/Council of Writing Program Administrators' White Paper on Writing Assessment (2008; <http://www.wpacouncil.org/whitepaper>) and the Conference on College Composition and Communication's Writing Assessment: A Position Statement (2008; <http://www.ncte.org/cccc/resources/positions/123784.htm>)

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Content Development:** The ways in which the text explores and represents its topic in relation to its audience and purpose.
- **Context of and purpose for writing:** The context of writing is the situation surrounding a text: who is reading it? who is writing it? Under what circumstances will the text be shared or circulated? What social or political factors might affect how the text is composed or interpreted? The purpose for writing is the writer's intended effect on an audience. Writers might want to persuade or inform; they might want to report or summarize information; they might want to work through complexity or confusion; they might want to argue with other writers, or connect with other writers; they might want to convey urgency or amuse; they might write for themselves or for an assignment or to remember.
- **Disciplinary conventions:** Formal and informal rules that constitute what is seen generally as appropriate within different academic fields, e.g. introductory strategies, use of passive voice or first person point of view, expectations for thesis or hypothesis, expectations for kinds of evidence and support that are appropriate to the task at hand, use of primary and secondary sources to provide evidence and support arguments and to document critical perspectives on the topic. Writers will incorporate sources according to disciplinary and genre conventions, according to the writer's purpose for the text. Through increasingly sophisticated use of sources, writers develop an ability to differentiate between their own ideas and the ideas of others, credit and build upon work already accomplished in the field or issue they are addressing, and provide meaningful examples to readers.
- **Evidence:** Source material that is used to extend, in purposeful ways, writers' ideas in a text.
- **Genre conventions:** Formal and informal rules for particular kinds of texts and/or media that guide formatting, organization, and stylistic choices, e.g. lab reports, academic papers, poetry, webpages, or personal essays.
- **Sources:** Texts (written, oral, behavioral, visual, or other) that writers draw on as they work for a variety of purposes -- to extend, argue with, develop, define, or shape their ideas, for example.

WRITTEN COMMUNICATION VALUE RUBRIC

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Definition

Written communication is the development and expression of ideas in writing. Written communication involves learning to work in many genres and styles. It can involve working with many different writing technologies, and mixing texts, data, and images. Written communication abilities develop through iterative experiences across the curriculum.

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Context of and purpose for writing <i>Includes considerations of audience, purpose, and the circumstances surrounding the writing task(s).</i>	Demonstrates a thorough understanding of context, audience, and purpose that is responsive to the assigned task(s) and focuses all elements of the work.	Demonstrates adequate consideration of context, audience, and purpose and a clear focus on the assigned task(s) (e.g., the task aligns with audience, purpose, and context).	Demonstrates awareness of context, audience, purpose, and to the assigned tasks(s) (e.g., begins to show awareness of audience's perceptions and assumptions).	Demonstrates minimal attention to context, audience, purpose, and to the assigned tasks(s) (e.g., expectation of instructor or self as audience).
Content Development	Uses appropriate, relevant, and compelling content to illustrate mastery of the subject, conveying the writer's understanding, and shaping the whole work.	Uses appropriate, relevant, and compelling content to explore ideas within the context of the discipline and shape the whole work.	Uses appropriate and relevant content to develop and explore ideas through most of the work.	Uses appropriate and relevant content to develop simple ideas in some parts of the work.
Genre and disciplinary conventions <i>Formal and informal rules inherent in the expectations for writing in particular forms and/or academic fields (please see glossary).</i>	Demonstrates detailed attention to and successful execution of a wide range of conventions particular to a specific discipline and/or writing task (s) including organization, content, presentation, formatting, and stylistic choices.	Demonstrates consistent use of important conventions particular to a specific discipline and/or writing task(s), including organization, content, presentation, and stylistic choices.	Follows expectations appropriate to a specific discipline and/or writing task(s) for basic organization, content, and presentation.	Attempts to use a consistent system for basic organization and presentation.
Sources and evidence	Demonstrates skillful use of high quality, credible, relevant sources to develop ideas that are appropriate for the discipline and genre of the writing.	Demonstrates consistent use of credible, relevant sources to support ideas that are situated within the discipline and genre of the writing.	Demonstrates an attempt to use credible and/or relevant sources to support ideas that are appropriate for the discipline and genre of the writing.	Demonstrates an attempt to use sources to support ideas in the writing.
Control of syntax and mechanics	Uses graceful language that skillfully communicates meaning to readers with clarity and fluency, and is virtually error-free.	Uses straightforward language that generally conveys meaning to readers. The language in the portfolio has few errors.	Uses language that generally conveys meaning to readers with clarity, although writing may include some errors.	Uses language that sometimes impedes meaning because of errors in usage.

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Definition

Inquiry is a systematic process of exploring issues, objects or works through the collection and analysis of evidence that results in informed conclusions or judgments. Analysis is the process of breaking complex topics or issues into parts to gain a better understanding of them.

Framing Language

This rubric is designed for use in a wide variety of disciplines. Since the terminology and process of inquiry are discipline-specific, an effort has been made to use broad language which reflects multiple approaches and assignments while addressing the fundamental elements of sound inquiry and analysis (including topic selection, existing knowledge, design, analysis, etc.) The rubric language assumes that the inquiry and analysis process carried out by the student is appropriate for the discipline required. For example, if analysis using statistical methods is appropriate for the discipline then a student would be expected to use an appropriate statistical methodology for that analysis. If a student does not use a discipline-appropriate process for any criterion, that work should receive a performance rating of "1" or "0" for that criterion.

In addition, this rubric addresses the **products** of analysis and inquiry, not the **processes** themselves. The complexity of inquiry and analysis tasks is determined in part by how much information or guidance is provided to a student and how much the student constructs. The more the student constructs, the more complex the inquiry process. For this reason, while the rubric can be used if the assignments or purposes for work are unknown, it will work most effectively when those are known. Finally, faculty are encouraged to adapt the essence and language of each rubric criterion to the disciplinary or interdisciplinary context to which it is applied.

Glossary

The definitions that follow were developed to clarify terms and concepts used in this rubric only.

- **Conclusions:** A synthesis of key findings drawn from research/evidence.
- **Limitations:** Critique of the process or evidence.
- **Implications:** How inquiry results apply to a larger context or the real world.

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Definition

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Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Topic selection	Identifies a creative, focused, and manageable topic that addresses potentially significant yet previously less-explored aspects of the topic.	Identifies a focused and manageable/ doable topic that appropriately addresses relevant aspects of the topic.	Identifies a topic that while manageable/ doable, is too narrowly focused and leaves out relevant aspects of the topic.	Identifies a topic that is far too general and wide-ranging as to be manageable and doable.
Existing knowledge, research, and/or views	Synthesizes in depth information from relevant sources representing various points of view/approaches.	Presents in depth information from relevant sources representing various points of view/approaches.	Presents information from relevant sources representing limited points of view/approaches.	Presents information from irrelevant sources representing limited points of view/approaches.
Design process	All elements of the methodology or theoretical framework are skillfully developed. Appropriate methodology or theoretical frameworks may be synthesized from across disciplines or from relevant sub-disciplines.	Critical elements of the methodology or theoretical framework are appropriately developed however more subtle elements are ignored or unaccounted for.	Critical elements of the methodology or theoretical framework are missing, incorrectly developed or unfocused.	Inquiry design demonstrates a misunderstanding of the methodology or theoretical framework.
Analysis	Organizes and synthesizes evidence to reveal insightful patterns, differences, or similarities related to focus.	Organizes evidence to reveal important patterns, differences, or similarities related to focus.	Organizes evidence but the organization is not effective in revealing important patterns, differences or similarities.	Lists evidence but it is not organized and/or is unrelated to focus.
Conclusions	States a conclusion that is a logical extrapolation from the inquiry findings.	States a conclusion focused solely on the inquiry findings. The conclusion arises specifically from and responds specifically to the inquiry findings.	States a general conclusion that, because it is so general, also applies beyond the scope of the inquiry findings.	States an ambiguous, illogical or unsupported conclusion from inquiry findings.
Limitations and implications	Insightfully discusses in detail relevant and supported limitations and implications	Discusses relevant and supported limitations and implications	Presents relevant and supported limitations and implications	Presents limitations and implications, but they are possibly irrelevant and unsupported

10.10 Appendix J – L07 Rubric (function as part of a multidisciplinary team)

TEAMWORK VALUE RUBRIC

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Definition

Teamwork is behaviors under the control of individual team members (effort they put into team tasks, their manner of interacting with others on team, and the quantity and quality of contributions they make to team discussions.)

Framing Language

Students participate on many different teams, in many different settings. For example, a given student may work on separate teams to complete a lab assignment, give an oral presentation, or complete a community service project. Furthermore, the people the student works with are likely to be different in each of these different teams. As a result, it is assumed that a work sample or collection of work that demonstrates a student's teamwork skills could include a diverse range of inputs. This rubric is designed to function across all of these different settings.

Two characteristics define the ways in which this rubric is to be used. First, the rubric is meant to assess the teamwork of an individual student, not the team as a whole. Therefore, it is possible for a student to receive high ratings, even if the team as a whole is rather flawed. Similarly, a student could receive low ratings, even if the team as a whole works fairly well. Second, this rubric is designed to measure the quality of a **process**, rather than the quality of an **end-product**. As a result, work samples or collections of work will need to include some evidence of the individual's interactions within the team. The final product of the team's work (e.g., a written lab report) is insufficient, as it does not provide insight into the functioning of the team.

It is recommended that work samples or collections of work for this outcome come from one (or more) of the following three sources: (1) students' own reflections about their contribution to a team's functioning; (2) evaluation or feedback from fellow team members about students' contribution to the team's functioning; or (3) the evaluation of an outside observer regarding students' contributions to a team's functioning. These three sources differ considerably in the resource demands they place on an institution. It is recommended that institutions using this rubric consider carefully the resources they are able to allocate to the assessment of teamwork and choose a means of compiling work samples or collections of work that best suits their priorities, needs, and abilities.

TEAMWORK VALUE RUBRIC

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Definition

Teamwork is behaviors under the control of individual team members (effort they put into team tasks, their manner of interacting with others on team, and the quantity and quality of contributions they make to team discussions.)

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Contributes to team meetings	Helps the team move forward by articulating the merits of alternative ideas or proposals.	Offers alternative solutions or courses of action that build on the ideas of others.	Offers new suggestions to advance the work of the group.	Shares ideas but does not advance the work of the group.
Facilitates the contributions of team members	Engages team members in ways that facilitate their contributions to meetings by both constructively building upon or synthesizing the contributions of others as well as noticing when someone is not participating and inviting them to engage.	Engages team members in ways that facilitate their contributions to meetings by constructively building upon or synthesizing the contributions of others.	Engages team members in ways that facilitate their contributions to meetings by restating the views of other team members and/or asking questions for clarification.	Engages team members by taking turns and listening to others without interrupting.
Individual contributions outside of team meetings	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive and advances the project. Proactively helps other team members complete their assigned tasks to a similar level of excellence.	Completes all assigned tasks by deadline; work accomplished is thorough, comprehensive and advances the project.	Completes all assigned tasks by deadline; work accomplished advances the project.	Completes all assigned tasks by deadline.
Fosters constructive team climate	Supports a constructive team climate by doing all of the following: <ul style="list-style-type: none"> • Treats team members respectfully by being polite and constructive in communication. • Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. • Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. • Provides assistance and/or encouragement to team members. 	Supports a constructive team climate by doing any three of the following: <ul style="list-style-type: none"> • Treats team members respectfully by being polite and constructive in communication. • Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. • Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. • Provides assistance and/or encouragement to team members. 	Supports a constructive team climate by doing any two of the following: <ul style="list-style-type: none"> • Treats team members respectfully by being polite and constructive in communication. • Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. • Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. • Provides assistance and/or encouragement to team members. 	Supports a constructive team climate by doing any one of the following: <ul style="list-style-type: none"> • Treats team members respectfully by being polite and constructive in communication. • Uses positive vocal or written tone, facial expressions, and/or body language to convey a positive attitude about the team and its work. • Motivates teammates by expressing confidence about the importance of the task and the team's ability to accomplish it. • Provides assistance and/or encouragement to team members.
Responds to conflict	Addresses destructive conflict directly and constructively, helping to manage/resolve it in a way that strengthens overall team cohesiveness and future effectiveness	Identifies and acknowledges conflict and stays engaged with it	Redirecting focus toward common ground, toward task at hand (away from conflict)	Passively accepts alternate viewpoints/ideas/opinions.

INFORMATION LITERACY VALUE RUBRIC

for more information, please contact value@aacu.org



The VALUE rubrics were developed by teams of faculty experts representing colleges and universities across the United States through a process that examined many existing campus rubrics and related documents for each learning outcome and incorporated additional feedback from faculty. The rubrics articulate fundamental criteria for each learning outcome, with performance descriptors demonstrating progressively more sophisticated levels of attainment. The rubrics are intended for institutional-level use in evaluating and discussing student learning, not for grading. The core expectations articulated in all 15 of the VALUE rubrics can and should be translated into the language of individual campuses, disciplines, and even courses. The utility of the VALUE rubrics is to position learning at all undergraduate levels within a basic framework of expectations such that evidence of learning can be shared nationally through a common dialog and understanding of student success.

Definition

The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand. -
Adopted from The National Forum on Information Literacy

Framing Language

This rubric is recommended for use evaluating a collection of work, rather than a single work sample in order to fully gauge students' information skills. Ideally, a collection of work would contain a wide variety of different types of work and might include: research papers, editorials, speeches, grant proposals, marketing or business plans, PowerPoint presentations, posters, literature reviews, position papers, and argument critiques to name a few. In addition, a description of the assignments with the instructions that initiated the student work would be vital in providing the complete context for the work. Although a student's final work must stand on its own, evidence of a student's research and information gathering processes, such as a research journal/diary, could provide further demonstration of a student's information proficiency and for some criteria on this rubric would be required.

INFORMATION LITERACY VALUE RUBRIC

for more information, please contact value@aacu.org



Definition

The ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively and responsibly use and share that information for the problem at hand. - The National Forum on Information Literacy

Evaluators are encouraged to assign a zero to any work sample or collection of work that does not meet benchmark (cell one) level performance.

	Capstone 4	Milestones		Benchmark 1
		3	2	
Determine the extent of information needed	Effectively defines the scope of the research question or thesis. Effectively determines key concepts. Types of information (sources) selected directly relate to concepts or answer research question.	Defines the scope of the research question or thesis completely. Can determine key concepts. Types of information (sources) selected relate to concepts or answer research question.	Defines the scope of the research question or thesis incompletely (parts are missing, remains too broad or too narrow, etc.). Can determine key concepts. Types of information (sources) selected partially relate to concepts or answer research question.	Has difficulty defining the scope of the research question or thesis. Has difficulty determining key concepts. Types of information (sources) selected do not relate to concepts or answer research question.
Access the needed information	Accesses information using effective, well-designed search strategies and most appropriate information sources.	Accesses information using variety of search strategies and some relevant information sources. Demonstrates ability to refine search.	Accesses information using simple search strategies, retrieves information from limited and similar sources.	Accesses information randomly, retrieves information that lacks relevance and quality.
Evaluate information and its sources critically	Thoroughly (systematically and methodically) analyzes own and others' assumptions and carefully evaluates the relevance of contexts when presenting a position.	Identifies own and others' assumptions and several relevant contexts when presenting a position.	Questions some assumptions. Identifies several relevant contexts when presenting a position. May be more aware of others' assumptions than one's own (or vice versa).	Shows an emerging awareness of present assumptions (sometimes labels assertions as assumptions). Begins to identify some contexts when presenting a position.
Use information effectively to accomplish a specific purpose	Communicates, organizes and synthesizes information from sources to fully achieve a specific purpose, with clarity and depth	Communicates, organizes and synthesizes information from sources. Intended purpose is achieved.	Communicates and organizes information from sources. The information is not yet synthesized, so the intended purpose is not fully achieved.	Communicates information from sources. The information is fragmented and/or used inappropriately (misquoted, taken out of context, or incorrectly paraphrased, etc.), so the intended purpose is not achieved.
Access and use information ethically and legally	Students use correctly all of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrate a full understanding of the ethical and legal restrictions on the use of published, confidential and/or proprietary information.	Students use correctly three of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential and/or proprietary information.	Students use correctly two of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential and/or proprietary information.	Students use correctly one of the following information use strategies (use of citations and references; choice of paraphrasing, summary, or quoting; using information in ways that are true to original context; distinguishing between common knowledge and ideas requiring attribution) and demonstrates a full understanding of the ethical and legal restrictions on the use of published, confidential and/or proprietary information.

NRES Program Assessment Rubrics, October 2020

#1—Data Collection Methods and Analytical Techniques

SLO Aspect	Master	Apprentice	Novice	Recruit
Data collection/analytical technique	Illustrates mastery of the process of data collection via the identified methodological framework; effectively implements appropriate analytical methods	Data collection and analytical approaches show good, yet imperfect grasp of the rationale for and importance of NR methods	Data collection and analytical approaches reflect a basic grasp of appropriate NR methods	Little evidence of a grasp of the data collection and analytical approaches involved
Data management & analysis	Data are well-managed in terms of appropriate units and significant figures and the like; data presentation is clear and easy-to-follow; calculations are both transparent and well-justified	Data and its presentation, along with any underlying calculations, are managed in a generally favorable way (with some shortcomings)	Some data management follows anticipated NR strategies; other aspects of the project could lead to inappropriate conclusions (due to issues of data management and/or analytical methods)	Little evidence of an understanding of the need for precision in data management and analytical methods
Data interpretation	Appropriate inferences are drawn, and are clearly based on strengths and limitations of the available measurements	Inferences are drawn; however, some may not reflect the data as described and presented	Inferences bear little sign of connection with the data as developed and presented	No inferences are detectable, or inference made contradict the data presented

NRES Program Assessment Rubrics, October 2020

#2—Integration of Principles of Human Systems

SLO Aspect	Master	Apprentice	Novice	Recruit
Marshalls, deploys accurate supporting information	Selects essential information to include, arrays in an effective manner, documents sources well			
Builds framework for human system/NR issue interactions well	Develops clear rationale for human system interaction with NR issue(s) involved; highlights interrelationships/tensions effectively			
Grasps social dynamics of complex NR issues	Displays comprehension of and compassion for human element in NR issues			

NRES Program Assessment Rubrics, October 2020

#3—Drawing Conclusions/Marking Recommendations

SLO Aspect	Master	Apprentice	Novice	Recruit
Identifies a focused NR issue	Aspects of a focused NR issue are well-articulated and appropriately weighted			
Evaluates potential solutions	Credibly presents a range of possible solutions to the NR issue; convincingly displays a rich grasp of the complexities involved			
Provides and supports clear recommendations and/or conclusions for NR issue	Recommendations clearly related to and effectively drawn from project definition and evaluation			

NRES Program Assessment Rubrics, October 2020

#4A—Function in Multi-disciplinary Teams

SLO Aspect	Master	Apprentice	Novice	Recruit
Active processes to engage all team members are well-documented	Provides evidence of active steps to engage all team members in appropriate ways			
All team members fully engaged in full project process	No single student dominates the project’s development or delivery; all students are actively engaged in their roles as part of the team			
Final product represents more substance, quality than would be expected of a product by the best single student	Project appears to be more than the “sum of its parts”; project is well-synthesized and well-calibrated for high impact			

NRES Program Assessment Rubrics, October 2020

#4B—Communicate Natural Resource and Environmental Issues in Written Form

SLO Aspect	Master	Apprentice	Novice	Recruit
Title/abstract/summary/introduction provide clear entry to an important NR-related issue	NR issue is well-described and placed in an authentic and relevant context; approach to issue is enticing and memorable			
Writing reflects analysis, synthesis, assessment and/or interpretation of ideas and evidence	Writing flows from concept to concept, from idea to idea in a clear and understandable manner			
Organization and development lead naturally to recommendations and/or conclusions	Recommendations and/or conclusions follow naturally from, are clearly supported by the main text of the document			

NRES Program Assessment Rubrics, October 2020

#4C—Communicate Natural Resource and Environmental Issues in Visual/Oral Format

SLO Aspect	Master	Apprentice	Novice	Recruit
Project's goals and activities are made clear and relevant to NR work	Primary goals and core activities are not only presented but are also well-integrated			
Visual materials and/or oral aspect enhance the communication of the project	Materials and/or presentation effectively communicate the essence of the project above and beyond a textual approach			
Project's approach and affect are thoroughly professional	Compelling professional approach that manages to appeal to a diverse audience			



Baldwin



Slusher



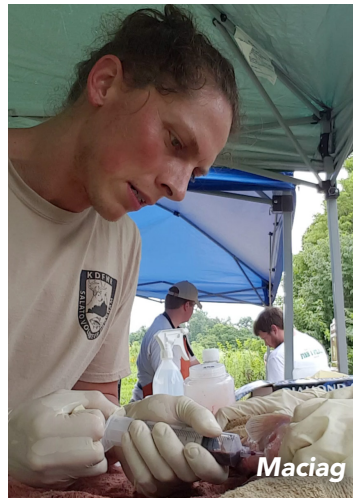
Matthews



Skinner



Dykes



Maciag



Rogers

NATURAL RESOURCES AND ENVIRONMENTAL SCIENCE



SPECIAL THANKS TO OUR SPEAKER KRISTY STROUD NOWAK

Kristy Nowak graduated from the NRCM (now NRES) program at UK in 2006. She later earned an MS in Environmental Science from Kentucky State University in 2010. Since 2007, Kristy has worked at the Kentucky Department of Fish and Wildlife Resources, where she is currently an Environmental Biologist Consultant. She has worked extensively on a variety of projects related to stream and wetland mitigation and restoration. She conducts field and laboratory analysis, works with regulatory permits and reporting, and develops environmental education and outreach.

Thursday, October 13, 2016
5:00 - 7:30 pm E.S. Good Barn

 College of Agriculture,
Food and Environment

WWW.UKY.EDU/NRES

STUDENT PRESENTERS

Josh Baldwin, Kentucky Department of Fish and Wildlife Resources (KDFWR): This summer I interned department-wide with KDFWR and was involved in projects across the spectrum of the department's work. My largest undertaking was spending a month under the Management Foreman at Clay Wildlife Management Area in Nicholas County where I assisted in food plot planting, field clearing, and edge feathering to promote oak regeneration.

Joe Brenzel, LFUCG Department of Environmental Services: This summer I had the opportunity to serve as an Environmental Outreach and Communication Intern for Lexington's Department of Environmental Services. I was tasked with helping coordinate and represent the city of Lexington at several community events, such as Reforest the Bluegrass, Bark in the Park, and River Sweep. Additionally, I created and distributed door hangers for different outreach campaigns and helped update and create content for the city's website.

Hunter Dykes-Pace, Kentucky Wildlife Center: This summer I had the opportunity to work at the Kentucky Wildlife Center for my internship. The purpose of the facility is to rescue, rehabilitate, and release wildlife. My main duties include feeding, medicating, cleaning, and observing the animals. I focused my internship on the management of infectious diseases in raccoons.

Chad W. Goodrich, Fouser Environmental: This summer I worked with Kyle Miller and the Fouser staff in Versailles, Kentucky. My main task was helping them test water samples for drinking and wastewater quality. They employ many different methods and receive water samples from all over Kentucky, as well as parts of West Virginia and Tennessee.

Lee Hudson, LFUCG Division of Water Quality: This summer I had the opportunity to work for the Lexington-Fayette Urban County Government, Division of Water Quality. Specifically, I worked for the post-construction stormwater controls team under Jason Martin. Working under the consent decree issued by the EPA, we were responsible for the inspection and maintenance requirements for stormwater best management practice (BMP) control devices. These devices capture and control sediment and debris from leaving the public storm sewers and entering the watershed.

Michaela Lambert, UK Department of Forestry: I worked with Dr. Steven Price in his Herpetology and Stream Ecology Laboratory conducting research on frogs in the West Kentucky Wildlife Management Area, McCracken Co., KY. Data loggers that recorded frog calls and environmental noise were deployed at seven ponds from late February to late April. I evaluated the trends in frog calling data to show when each frog species is likely to be calling, including the IUCN Red List Near Threatened Species and Kentucky Species of Greatest Conservation Need, the Crawfish Frog (*Lithobates areolatus*).

Chase Jones, LFUCG Division of Water Quality: This summer I interned with the Lexington Fayette Urban County Government (LFUCG) Division of Water Quality. My job consisted of retention and detention basin inspections throughout the eight watersheds of Fayette County, and determining whether or not LFUCG's stormwater mitigation structures were in compliance and functioning properly.

Daren Jones, Raven Run Nature Sanctuary: This summer I worked as a Recreation Leader for the LFUCG Division of Parks and Recreation. My main duties were trail maintenance and environmental education. To further this effort, I did an independent project to remap the existing trails and compute the environmental impact they have on the Nature Sanctuary.

Joe Maciag, Salato Wildlife Education Center: This summer I had the opportunity to participate in conservation education, as well as off-site activities that helped the Center for Mollusk Conservation in Frankfort, KY. My main duties were to give visual and hands-on education on different reptiles and birds of prey, holding the animals for the public to see and touch while educating them on the animal. My off-site activities included mussel tagging and drawing blood from fish to assist in the laboratory production of native mussels (some endangered) that occurs at the Center for Mollusk Conservation.

Jonathan Matthews, UK Department of Forestry: This summer I had the opportunity to work with Dr. Steve Price and Jenn McKenzie studying Snake Fungal Disease in Kentucky. Along with their research, I did an independent project studying the microhabitat preference of Northern Watersnakes and Queensnakes infected with Snake Fungal Disease.

Ryan McGregor, U.S. and Kentucky Fish and Wildlife Departments: This summer I had the opportunity to do a wide variety of things across the states of Kentucky and Tennessee while working for both the U.S. and Kentucky Fish and Wildlife Departments. I assisted in sampling for freshwater mussels, netting for bats, tagging and release of endangered freshwater mussels, conducting a research project on roost tree creation for Indiana bats on the Ft. Knox military base, and many other things!

William Rigney, Raven Run Nature Sanctuary: This summer I had the opportunity to work for Raven Run Nature Sanctuary as a Recreation Leader. Job duties included natural areas maintenance and restoration, leading educational programs, carpentry, tree care, emergency first aid, managing power equipment, and helping citizens experience the joy of nature. I also worked on developing several new land management recommendations and job codes.

Adrienne Rogers, Kentucky Department of Environmental Protection: This past summer I completed an internship with the Kentucky Department of Environmental Protection. My day-to-day duties involved accompanying inspectors out on state permit inspections, completing ambient quality standard testing, and writing reports.

Nathan Skinner, Eco-Tech Consultants: This summer I worked as a restoration field technician in Louisville, Kentucky. Most of the time was spent working in The Parklands at Floyds Fork. My duties consisted of identifying and removing invasive exotic plants, tree planting and maintenance, and site preparation for prairie installations throughout The Parklands. Additionally, we worked on multiple private landowners' properties where invasive exotic plants were targeted for removal to improve the woodland quality for both native flora and fauna.

Brandon Slusher, UK Department of Forestry: This summer I worked in the Price lab on UK's campus. I was a field tech for Jennifer Mckenzie where I aided on her research for a project on snake fungal disease. My primary job was doing field work scanning, catching snakes, and collecting data.

Keegan Smith, Urban Forest Initiative: This past spring I served as a student intern at the Urban Forest Initiative, working in collaboration with UK's Physical Plant Division. My internship primarily focused on assisting with tree care across UK's campus and organizing a service project under the supervision of UFI staff member, Nic Williamson. For my independent project, I studied the potential causes of chlorosis on willow oak trees on campus, which allowed me to use my focus in soil science.

Joyia Williams, Natural Resources Conservation Service (NRCS): I spent my time this summer working for the NRCS as a student trainee in Harrodsburg, KY. My main duties were assisting with land measurements, discussing best management practices, and plant identification. My supervisor and I went to farmlands and grasslands across Mercer and Boyle counties. We also visited cities such as Danville and Perryville.

SCHEDULE

5:15pm
Welcome and Introductions:
Dr. Jack Schieffer,
Agricultural Economics

5:20 pm
Presenters:
Kristy Nowak, NRCM Alumnae
Michaela Lambert, NRE 395, NRES senior
Josh Baldwin, NRE 399, NRES senior

6:00 pm
Poster Presentations:
NRE 395 Independent Study in Natural Resources
NRE 399 Experiential Education in Natural Resources





2017 Internship Forum

NRES Internships and Research Experiences
October 12, 2017, 5:00-7:30pm, Good Barn

 College of Agriculture,
Food and Environment

Student Experiences

Cameron Baller, Beyond Expectation Environmental Project (BEEP): BEEP is an environmental education non-governmental organization based in the Western Cape, outside of Cape Town, South Africa. It employs experiential learning and leadership development to engage marginalized youth in critical environmental issues. My internship included assisting in after-school workshops, community gardening and camping trips to the top of Table Mountain. I was also able to assist BEEP in fundraising and developing surveys for internal research focused on improving the impact of BEEP.

Amelia Baylon, Pine Mountain Settlement School: This summer my internship with the UK's Kentucky Scholar Intern Program paired me with the Pine Mountain Settlement School to work as an environmental educator at its community and educational center. My primary duties were to assist the staff with its place-based environmental and Appalachian cultural programs for K-12 and some adult audiences. In addition to education, I maintained and created trails at a nature preserve and cared for the school's classroom animals.

Mitchell Boles, Kentucky Department of Fish and Wildlife Resources: During this spring semester I was fortunate enough to work at KDFWR Pfeiffer Fish Hatchery, under the supervision of Josh Pennington. At Pfeiffer, we worked tirelessly raising and stocking multiple fish species to improve the biodiversity and populations of Kentucky's over-exploited aquatic ecosystem. The major projects we have been tasked with is the reintroduction of the Alligator Gar and Lake Sturgeon, both Regional threatened or extinct species.

Justin Browning, H&A Resource Management: This summer I interned with H&A Resource Management and completed various tasks such as taking sludge samples, aiding in the set up and taking down of job sites, and helping to input information into a program to track the work being accomplished by the equipment that we used. I was able to learn about many different wastewater and water treatment plants while seeing concepts I have learned in some of my classes be applied while on the job.

Rachel Cook, Urban Forest Initiative: During the 2016-17 school year, I worked with Urban Forest Initiative here at the University of Kentucky. Their main mission is to engage the campus and Lexington community in conversations about urban trees and their value. I primarily worked on outreach, attending multiple events as an educational table and through social media. I developed my own independent project that targeted local high school students, with the goal of educating the students, facilitating a deeper connection to the tree

canopy around them, and empowering them to share this information with others.

Julianna Dantzer, UK Department of Sociology: Last semester I conducted research with former faculty member Dr. Shannon Bell. My project was to create a community guide for people facing environmental injustices, specifically focusing on natural gas liquids pipelines. Drawing primarily from interviews of those who successfully defeated these pipelines, I primarily outlined issues with natural gas pipelines, tips for organizing resistance movements, and previously used industry tactics.

Daniel Eaton, Davey Tree Expert Company: This summer I had the opportunity to intern at Davey Tree's Olathe, Kansas office. During my time at Davey I worked with the sales arborist, the tree trimming crew and the plant healthcare department. I also developed a map aging urban development in the Kansas City Metro Area using GIS.

Melissa Fitzgerald, Kentucky Department of Fish and Wildlife Resources (KDFWR): This summer 2017, I was allowed the opportunity to be a Conservation Education Intern at the Salato Wildlife Education Center in Frankfort Kentucky. I worked closely with Geoffrey Roberts who is the Internship Coordinator, Raptor Program Coordinator, and a Conservation Educator. My main duties were to educate the public about the native mammals, reptiles, and birds of prey in Kentucky as well as provide site maintenance and special event help.



David Jalbert with a red-tailed hawk

Nicole Funk, Sanibel Sea School: This summer I worked as a Marine Science Educational Counselor at Sanibel Sea School in Sanibel Island, Florida. During each week of the summer "Island Skills" camp, I led a group of 10-15 children (ages 6-13) through environmental and outdoor/adventure education activities focused on learning marine-related concepts and bringing campers out of their comfort zones.

Jacob Harris, McConnell Springs: This summer I began working alongside the park staff at a beautiful urban forest remnant in Lexington, Kentucky. I was assigned with many tasks at the park including trail maintenance, invasive species removal and data collecting. The task that I spent the most time on, however, was a Forest Template Project I developed after I was asked to manage a small section of forested area within the park.

Richard Helsley, Klamath National Forest: This summer I worked as a Wildlife Intern at Klamath National Forest in Mt. Hebron California. My duties were to locate and evaluate the

threatened Northern Spotted Owl along with several other protected and key forest species. These surveys are vital to understanding what is happening within the forest and the health of the wild populations, which is used to indicate overall forest health.

David Jalbert, Salato Wildlife Education Center: This summer, I had the pleasure of interning at the Salato Wildlife Education Center in Frankfort, KY. My main duties included interpreting wildlife exhibits and interacting with the public using props, as well as live reptiles and raptors. I also had the opportunity to get involved in various special events hosted by the Kentucky Department of Fish and Wildlife Resources.

Brandon Lawrence, Georgetown Municipal Water and Sewer Service: This summer I had the opportunity to work at the Georgetown water treatment plant. For my internship, I conducted a nitrification study on the water distribution system of Scott County. During this study I collected 1,500+ data points, and then wrote a scientific report of my findings.

Isaac Marrs, Archipelagos Institute of Marine Conservation: This summer I had the opportunity of working with the Archipelagos Institute of Marine Conservation located in Greece. I was a part of the Terrestrial Conservation team and my research included studying golden jackals, chameleons, threatened birds, dragonflies, endemic plants, and soil productivity on the Greek islands of Samos and Ikaria.

Hannah Moore, Forest Health Research and Education Center: This semester I am working with Dr. Ellen Crocker and other members of the University of Kentucky Forestry Extension program. Currently I am assisting with educational events and contributing to the design and content of the program's website. I will also be independently preparing and giving a presentation on insect pests at an urban forest-related workshop.

Daniel Morgan, Raven Run Nature Sanctuary: This summer I had the opportunity to intern at Raven Run Nature Sanctuary. My main responsibilities as a recreation leader involved trail maintenance, emergency first aid, educational programs, and assisting the public with any questions/concerns. I also worked independently toward creating a native tree walk brochure. The brochure highlights tree species throughout the park which can be used for environmental education.

Mikayla Ojeda, UK Department of Forestry: I worked with Dr Matthew Springer and Jonathan Matthews on his graduate research with deer populations in Western Kentucky agricultural systems. We surveyed several sites around Princeton, KY using distance-based pellet sampling, then used trail camera photos to find the populations of white-tailed deer. These are being compared to determine which the most effective method for population surveys in Western Kentucky, and I am focusing on the most efficient way to use the trail camera method.

Schedule

Welcome and Introductions:

Dr. Jack Schieffer, Agricultural Economics

Presenters:

- Beverly James, Preserve Director, Floracliff Nature Sanctuary and NRCM (now NRES) 2003 Alumna
- Isaac Marrs, NRE 395, NRES senior
- Julianna Dantzer, NRE 399, NRES senior

Poster Presentations for:

NRE 395 Research in Natural Resources
NRE 399 Internship in Natural Resources

Rachel Pagano, Price Herpetology Lab: This summer I conducted an undergraduate research project through the Price Herpetology Lab in the UK department of forestry. I studied the thermoregulatory patterns of Queen snakes (*Regina septemvittata*) and Northern Water snakes (*Nerodia sipedon*) as it relates to an emergent snake fungal disease in a section of Elkhorn Creek in Lexington, Kentucky. I used ibutton temperature sensors to record constant environmental data and went to the site once a week to catch and process (take data regarding temperature, body condition, etc.) individual snakes to determine if there was any correlation between increased body temperature and the presence of the fungal infection.

Sarah Peter, UK Department of Biology: I worked with Dr. Phil Crowley in his pollinator research at the Ecological Research and Education Center, Lexington, KY. There were 35 circular plots, each 3 meters in diameter: 20 plots were used to assess Monarch Butterfly attractiveness and fitness and 15 plots were focused on Swallowtail Butterflies. I established the plots, then observed and collected preliminary data on pollinator visitors to milkweed plots.

Sara Stewart, UK Water Systems Working

Group: I am currently working as a Sustainability Intern under Dr. Carmen Agouridis, extension associate professor in Biosystems and Agricultural Engineering. For this position my time is divided between several ongoing projects, including those focused on stream restoration, sustainability, and stormwater.



Brandon Lawrence

Derek Thomas, UK Department of Forestry: This summer I had the opportunity to work with Dr. Christopher Barton in the UK Department of Forestry. I worked at the Savannah River Site located in Aiken South Carolina, I was responsible for collecting soil and water sample data to later be used in a stream restoration project that is planning on being implemented next summer.

Cecelia Tio, Washington County Engineer's Office: This summer I was able to work with the Washington County Engineer's Office in my hometown of Marietta, Ohio. During my internship, I was able to help with several different projects such as: bridge repair and maintenance, drainage maintenance, and culvert installation. My main duties were to ensure that ODOT environmental procedures were followed and that waterways remained clear of any possible construction pollutants.

McKenna Toenies, Kentucky Horse Park: This summer I was thrilled to be offered the opportunity to work with Mrs. Annie Hickey in the Kentucky Horse Park Volunteer and Outreach Management department. My requirements were to assist her in scheduling, planning and managing the 700+ volunteers we have at the horse park on a daily basis. I was also in charge of creating, planning, promoting and executing the Kentucky Horse Park Run/Walk Club.

Danny Truskot, H&A Resource Management: This summer I had the privilege of working at H&A Resource Management. During my time at H&A Resource Management, I assisted in the clean out, transport, and land application of residual biosolids from municipal water and wastewater treatment plants, as well as industrial food processors and distilleries.

Taylor Vincent, Wolf Run Wildlife Refuge: This summer I interned with Wolf Run Wildlife Refuge. Wolf Run's mission is to give back to wildlife through education, rescue, rehabilitation, release, and lifelong sanctuary. The rescue is



Nicole Funk

Beverly James is the Preserve Manager at Floracliff Nature Sanctuary, a 346-acre privately run, non-profit nature preserve in southern Fayette County. Beverly graduated from our program (then called Natural Resource Conservation and Management, NRCM) in 2004 with an emphasis in conservation biology. She oversees all aspects of managing the preserve, including invasive species removal, organizing environmental education programs, coordinating volunteer efforts, and fundraising, among many other responsibilities. Before joining Floracliff in 2006, Beverly worked for the Kentucky State Nature Preserves Commission and the Bernheim Arboretum and Research Forest.

home to a number of animals including 21 wolves. My daily tasks included cleaning out enclosures, checking in on all the residents, feeding, and make sure everyone has fresh water.

Madeleine Wamsley, Kentucky Children's Garden: This summer, I had the opportunity to work as an intern in the Kentucky Children's Garden. My main duties included both leading environmental educational programs for children who visited and performing upkeep within the garden. I also had the opportunity to design my own themed garden bed and modify the existing library and curriculum to make it more inclusive to children of all backgrounds.

Melinda Wolfe, City of Madisonville: This summer I had the opportunity to work with the parks department for the City of Madisonville Municipal Government. I worked as an intern for their developing nature park, Mahr Park at Hidden Hills Farms. My main duties were creating the script for the park's educational tour, which involved interacting with the Kentucky Division of Forestry, and recording data of bird species.

Rose Yeley, Raven Run Nature Sanctuary: This summer I worked at Raven Run Nature Sanctuary in Lexington, KY. My duties included trail maintenance, customer service, removing storm damage, invasive species removal, and leading educational programs for school groups and scouts. I also did an independent project on water quality throughout the park.

Sarah Yount, Aquatic Resources Management: This summer I worked as a lab technician for the environmental consulting company, Aquatic Resources. The company's primary focus is clean water, and typically works with coal companies. They provide the services of permitting, sampling and testing water. My duties included testing water samples for parameters such as alkalinity, acidity, and specific conductance in a wastewater laboratory as well as basic lab maintenance.

For more information, visit the Natural Resources and Environmental Science website: www.uky.edu/NRES
Or contact: Geri Philpott, NRES Academic Coordinator, geri.philpott@uky.edu, 859-257-2337

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KentuckyNRES





2018 Internship Forum

NRES Internships and Research Experiences
October 25, 2018, 5:00-7:30pm, Good Barn

 College of Agriculture,
Food and Environment

Schedule

Welcome and Introductions:

Dr. Jack Schieffer, Agricultural Economics

Presenters:

- Sandra Broadus, UK Alternative Transportation Manager and 2012 NRES Alumna
 - Keely Kohen, NRE 395, NRES senior
- Leandro "Nachie" Braga, NRE 399, NRES senior

Poster Presentations for:

NRE 395 Research in Natural Resources
NRE 399 Internship in Natural Resources

Student Experiences

Sarah Atkins, New Orleans Botanical Garden: This summer I worked as an intern under Ms. Susan Capley, the Education Director at the NOBG. My focus was All-American Selection Winning plants. I was responsible for maintaining and preparing plants and the garden for a National All-American Selection conference being held at the garden this fall. I also worked closely with the LSU Master gardeners aiding in their work and growth at NOBG, as well as occasionally helping with educational programs and activities.

Sophie Beavin, UK Recycling: I am currently an intern for UK Recycling through the Student Sustainability Internship Program. Their main mission is to increase diversion rates by 50% over the next five years by expanding recycling programs and increasing their outreach throughout campus. My responsibilities as their intern include supporting current programs, like the athletics recycling initiative, and developing an independent project that will stimulate a circular economy on UK's campus.

John Bernardo, UK Department of Plant and Soil Science: I worked with Dr. Coyne in the Agricultural Sciences North lab, where I enumerated canine fecal samples delineated from sites around Fayette County to understand potential contamination into the water column.

Adam Bourque, National Center for Appropriate Technology: This summer I had the opportunity to work at the National Center for Appropriate Technology in Butte, MT as an AmeriCorps, EnergyCorps Sustainable Agriculture and Energy Educator. I primarily assisted with the Armed to Farm program helping military veterans get started with small-scale farming operations. My main duties were to expand and organize the ATF database, assist with the ATF conference in New Hampshire, and construct educational resources on energy conservation for farm operations.

Crystal Bradley, Elemental Processing Lab: This summer I worked as a lab intern in an agricultural analysis lab in Lexington, KY. My main duties were sample preparation, analysis, data

conversion, and writing standard operating procedures. We also conducted research on the efficiency of agricultural processing of hemp under the Industrial Hemp Research Pilot Program.

Leandro "Nachie" Braga, Lankester Botanical Garden: I spent my summer working at the Lankester Botanical Gardens in Cartago, Costa Rica. My duties included caring for the largest public orchid collection in the Americas, clearing forested trails, and removing large problem trees from the property. During my stay I was able to design and implement two successful stormwater mitigation projects, where runoff from heavy tropical rainfall is captured and allowed to infiltrate into the soil.

Ben Cotton, Aquatic Resources Management LLC: For my summer internship, I worked in the waste water lab at Aquatic

Resources Management in the trace metals analysis section. My main duties were to receive and prepare waste water samples to be analyzed for trace metals using an inductively coupled plasma mass spectrometer. In addition, I also preformed whole effluent toxicity testing on coal mine runoff samples.

Allison Eades, UK Regulatory Services: I worked at UK's Regulatory Services soil lab with Diane Hunter and Dr. Frank Sikora. Dr. David McNear was my faculty advisor. At Regulatory Services, I helped prep and test soil samples that were sent in by the country extension offices and UK researchers. Once routine testing is complete, UK Regulatory Services provides information on soil and buffer pH, as well as a fertilizer recommendation for

the soil. In addition, I completed an individual study on the history and impacts of over- and under-fertilization on crops, soil, and water.

David Ehlert, UK Price Labs: This spring I had the opportunity to work on several projects in Price Labs with Dr. Steve Price and Michaela Lambert. The primary study I was involved in was the Paducah frog call project. During this study, I visited Paducah to set up frog loggers and analyzed data in the lab. Another study I participated in focused on snake fungal disease (SFD) in the Lexington area.



Ben Cotton, Aquatic Resources Management LLC

Jay Fuller, Wilderness Trace Solar, Inc.: This Spring Semester I had the opportunity to work with John Cotton and Danny Tolson at Wilderness Trace Solar, Inc. in Danville, Kentucky. My duties were to conduct a Full-Scale Energy Consumption Audit for the Jessamine County Public Library and Municipal Extension Buildings (JCPL), compose a 5-Tier Corrective Measures Report, and educate the staff of JCPL and the surrounding community on energy conservation and responsible electrical consumption methods. I also assisted in writing a Grant proposal for JCPL to help defer the cost of the Roof-Mounted Solar System that I helped install for them.

Daulton Haynes, UK Department of Earth and Environmental Science: I worked with Dr. Kevin Yeager in the Sedimentary and Environmental Radiochemistry Research Laboratory. For our research we collected soil samples from around the world and analyzed them in ways including their radiation, grain size, and everything in between. Our work changed daily depending on what our clients wanted from us, but the research is vital to many projects.

Joseph Hiltenbrand, UK Department of Plant and Soil Science: I worked with Dr. Christopher Matocha in his Soil Chemistry Laboratory researching Aluminum release rates and soil pH of soil that had various amounts of Nitrogen fertilizer added. No-till soil from the Central Kentucky region was analyzed using a stirred batch reaction, to determine amounts of Aluminum released from soil when mixed with a KCL solution. We were looking to determine if increased Nitrogen fertilizer would have any role in soil pH change as well as exchangeable Aluminum.

Hannah Hollowell, UK Forest Health Research and Education Center: This summer I had the opportunity to intern with Dr. Ellen Crocker at the Forest Health Research and Education Center. My main responsibilities included writing short informational articles for the FHC website and helping with outreach events for the public. I was also able to help conduct an independent project on the management of Chinese chestnut gall wasps using a fungal treatment.

Emily Ingram, Kuti Wildlife Reserve: This summer I worked as an intern at Kuti Wildlife Reserve in Salima, Malawi, a small country in central Africa. I conducted surveys for their zebra photo-identification project, cataloguing individual zebra's information and unique stripe patterns in a database. I also assisted with mapping the trails and the perimeter of the reserve, educating the community about the importance of wildlife conservation, and tending to their locally sustainable garden.

Isabel Jenkins, Kentucky Association for Environmental Education: This summer I worked as a Communications Intern for KAEE. My responsibilities included writing press releases, designing a monthly email newsletter, tabling at events, and creating social media posts. I also had the opportunity to work on multiple promotional videos for the nonprofit.

Jessica Jensen, Phigenics: This summer I had the opportunity to work as an Account Manager Intern at an independent water management company in Warrenville, IL. My duties included collecting water samples from many healthcare facilities all around the Midwest, conducting hazard control data, and sitting in on



Joshua Marshall, Kentucky American Water

various meetings with clients about their Water Management Programs.

Cody Jones, UK Arboretum: This summer I had the opportunity to be a member of the native plant staff at the University of Kentucky Arboretum. I gained valuable information about native plants throughout Kentucky and specifically, how to identify herbaceous plants and native trees. My duties included general maintenance and care of native plant areas, including pruning of trees. I also gained experience working with patrons in a public park setting that is also managed for plant biodiversity.

Bryan Kist, UK Urban Forest Initiative: This summer I had the privilege to work alongside Nic Williamson and the Urban Forest Initiative team as a TreeCAT intern. My main duties included inventorying street trees in Lexington's neighborhoods and helping to write tree reports based off of these inventories. I learned a considerable amount about tree identification and general arboriculture practices throughout the summer internship.

Keely Kohen, UK Department of Forestry and Natural Resources: This summer I worked for the one of FNRS Department Grad students as a River Otter Intern and Field Tech. I worked in New Mexico for two weeks and collected samples on the Upper Rio Grande for the diet study that is being conducted here at UK. When I got back to Lexington, I worked in the lab rinsing, sorting, and identifying the contents of the samples to be used for the creation of a prey key. From this experience I became involved with several other wildlife projects including fawn trapping with Southern Illinois University, deer damage surveying in Western Kentucky, and bear trapping with Kentucky Fish and Wildlife.

Colby Langford, UK Department of Entomology: I worked with Dr. Rieske-Kinney evaluating non-target effects of using double stranded RNA for EAB population management. The double stranded RNA is specifically designed to cause gene silencing and lead to mortality of EAB without implications to other insects. My work consisted of testing this theory by feeding various non-target insects the double stranded RNA and monitoring mortality rates.

Josh Marshall, Kentucky American Water: This past summer I had the opportunity to work at Kentucky American Water, the local water utility company the services Lexington and surrounding counties. While at work I learned many basic water utility skills including operating fire hydrants, reading water meters, assembling hydrant meters and navigating programs used by the company.

Samantha Martin, FoodChain: During my junior year, I had the opportunity to work at FoodChain, a local nonprofit. I was able to learn about marketing through my production of promotional videos.

Jeffrey McCall, USDA - Natural Resources Conservation Service: This summer I worked at the NRCS London, Kentucky field office. I took part in many different duties and type of work while I was there. The main things that I did were land surveys, and conservation planning. Conservation planning includes working with landowners to create a plan that will solve their resource problems.



Emily Ingram and Rachael Steffen, Kuti Wildlife Reserve

Clellan McMurry, Copperhead Environmental Consulting: This summer, I had the opportunity to work with Copperhead Environmental Consulting. During this internship, I did work on Indiana bats and Northern long-eared bats through endangered species surveys and research on a product that Copperhead Consulting has produced known as Brandenbark. I was able to do work in places like New York, Cleveland, Nashville, and Fort Knox.

Zack Meuth, UK Department of Entomology: During the Fall 2017 and Spring 2018 semesters, I worked as an intern for Dr. Riese-Kinney. I aided in the Healthy Trees Healthy People program. The program is aimed at getting people more active outdoors, while also increasing the public's knowledge about trees and forest health. I helped organize data, recorded tree statistics, and developed program material.

Isabella Norrid, Kentucky Wildlife Center: This summer I had the opportunity to work for Karen Bailey as an intern for the Kentucky Wildlife Center. The Center triages and rehabilitates orphaned and injured wildlife and then conducts a release for healthy animals. From fostering baby raccoons, to caring for bobcats, there isn't much I wasn't responsible for at the Center!

Arianna Nouel, Walt Disney World: This summer I worked as a Horticulture and Wildlife/Pest Management Intern for Walt Disney World Co. in Florida. My main duties were to assess forests and bush for rehabilitation and data gathering, control the native wildlife on all of Disney's property, perform preventative maintenance, and answer corrective calls from cast members and guests, educate cast members about plants and wildlife, issue environmental field reports, and practice management of invasive species on the premises, including both vegetation and wildlife management.

Ryan Pettit, Aquatic Laboratories LLC: Over the summer, I worked as a water quality analyst for Aquatic Laboratories in Lexington KY. During this experience I was exposed to a variety of different methods to test water which in turn, allowed me to make an assessment on the overall quality of the water.

Emma Rhodes, Kentucky Primate Rescue Center: This summer I had the opportunity to work with the Kentucky Primate Rescue Center in Wilmore, KY. I was responsible for preparing meals and

enrichment activities for each of the residents every day, as well as cleaning enclosures and maintaining the property as needed. I was able to learn a great deal about primate behavior and the exotic pet trade.

Rachael Steffen, Kuti Wildlife Reserve: This summer I had the opportunity to work as a wildlife management intern at Kuti Wildlife Reserve in Salima, Malawi. My main duties were to assist in an ongoing zebra photo identification project and the general upkeep of the reserve. I worked alongside wildlife management professionals who are dedicated to preserving the environment and positively impacting the surrounding Malawian communities.

Quinn Towery, Department of Forestry and Natural Resources: This summer I had the opportunity to work with Mary Arthur and Jordan Winkinbach in the Department of Forestry and Natural Resources. The research project I worked on focused on prescribed fires and their effect on Oak and Hickory regeneration in eastern Kentucky. My responsibilities this summer included identifying and measuring trees, navigating to the plots, and identifying herbaceous plants.

DeAnna Williams, Kentucky Department of Environmental Protection: This summer I had the opportunity to work as a Summer Research student with the KY Dept. for Environmental Protection, Division of Waste Management. My main responsibilities included conducting tire retailer inspections to ensure the proper storage and disposal of waste tires.

Paige Williams, Eastern Forest Environmental Threat Assessment Center: This summer I worked as a forestry intern at EFETAC, which is part of the Forest Service, in Raleigh, North Carolina. I did field and lab work for two projects, one on how hydrology changes as clearcut forest grows back, and one on carbon flux in loblolly pine ecosystems.

Rose Yeley, Maya Mountain Research Farm: This summer I worked at Maya Mountain Research Farm in the Toledo district of Belize where we focused on food security and environmental conservation. I planted Inga, jackfruit, cacao, mamey, coco yam, pineapple, kang kong, cassava, and other local food crops. I also helped develop a garden on the farm with the other interns.

Sandra Broadus is an alumni of the NRES program circa December 2012. After graduating and bouncing around to several temporary and seasonal jobs around the country, she discovered a passion for how transportation choices fit into sustainability, land use, and social justice issues. She is now the Alternative Transportation Manager at the University of Kentucky - coordinating bicycle, transit, and pedestrian programs and infrastructure on campus. She is also working on a Masters in Public Administration part time here at the Martin School, and serves as the Conservation Officer for the Bluegrass Wildwater Association.

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Or contact: Geri Philpott, NRES Academic Coordinator, geri.philpott@uky.edu, 859-257-2337

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KentuckyNRES





2019 Internship Forum

NRES Internships and Research Experiences
October 29, 2019, 5:30-7:30pm, Good Barn

 College of Agriculture,
Food and Environment

Schedule

Welcome and Introductions:

Dr. Jack Schieffer, Agricultural Economics

Presenters:

- Amy Sohner, Executive Director, Bluegrass Greensource NRCM (now NRES) '99
- Madison Moreno, NRES Student
- Hattie Nunley, NRES Student

Poster Presentations for:

NRE 395 Research in Natural Resources
NRE 399 Internship in Natural Resources

Brad Carter, Natural Resource

Conservation Service: I worked with the Natural Resource Conservation Service as a soil conservationist trainee. I worked with farmers and other landowners to implement conservation practices on their lands.



Alex Eberle, Palmer Engineering: While working as a GIS Analyst over the summer, I assisted in digital mapping and data creation for multiple state highway and interstate projects. I had the opportunity to work with an interdisciplinary team of technical writers, biologists and civil engineers. Some of the work I did included; ortho-photo rectification, corridor, crash, environmental, and historical impact analysis.

Beth Evers, Oregon Department of Fish and Wildlife:

This summer I was fortunate to work for ODFW District Office in The Dalles, Oregon. The district covers close to 20,000 acres including the Lower Deschutes Wildlife Region and parts of Mt. Hood National Forest. My main duties included checking and deploying trail cameras for wolves in the area.

John Paul Beard, UK Extension Office: I had the pleasure to work with Brad Lee and Suzette Walling during the Spring 2019 semester. I prepared a literature review of research I had been aiding with for the past two years. The research revolved around phosphorus contributions to aquatic systems from pet waste.

Jackson Bell, Lexington Tree Board: This summer I had the opportunity to work with Greg Doyle in the Lexington Tree Board. His project was to create an educational tree walk through Woodland Park in Lexington, Kentucky. Our project aims to inform the public of the importance of trees in an urban setting and how to identify them.



Holly Foster, UK Price Labs: I worked with Michaela Lambert and Dr. Steven Price on their research involving the crawfish frog (*Lithobates areolatus*) at the West Kentucky Wildlife

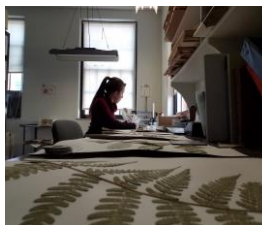
Management Area. Audio devices, known as frogloggers, recorded data from Pond 7, which I then listened to for the months of February and March to determine when the crawfish frog might call.



Quentin Bishop, Wood and Water Land Trust: This summer I had the opportunity to work with Deborah White and supervisor Ben Rasp at Woods and Water Land Trust to cooperate with local land owners to help remove invasive plants.

Rachel Bramel, Stanwood Wildlife Sanctuary: I spent the summer in Ellsworth Maine, just outside of Acadia National Park. At the sanctuary I gave tours of a historic homestead of a pioneer ornithologist, cared for and created enrichment opportunities for injured raptors in captivity, rehabilitated injured wildlife, designed habitats for a variety of species, and helped maintain miles of wooded trails.

Stephen Frank-Heun, Timber Titans: This summer I worked with a small newly founded company known as Timber Titans LLC (owned by Jay Fuller), based out of Midway, KY. The work was based around timber management and arborist services with some woodworking during free time. My duties were to assist with running proper equipment necessary in removal techniques, then using wood tools to form beautiful decorative pieces. My main course of work stretched throughout the state of KY.



Willie Graas, UK Herbarium: I worked as a technician for the UK Herbarium under the direction of curator Rob Paratley. The Herbarium showcases a growing catalog of the native flora of Kentucky. I processed new plant specimens and also participated on trips to collect specimens.

Viktor Halmos, The Food Connection at UK: For the Fall 2018 and Spring 2019 semesters, I had the opportunity to work with Dr. Lilian Brislen and Chef Tanya Whitehouse at the Food Connection. My role was co-leader and program chef for the #Adulting program. This internship included tasks such as menu planning, recipe research and creation, food preparation and preservation, and cooking demonstrations in front of students and faculty.



Richard Helsley, Lexington-Fayette County Urban Government: I worked as a GIS Intern with the Division of Environmental Quality within the Lexington-Fayette County Urban Government. I created a variety of maps: interactive, static, and story maps.

Nicholas Hope, Department for Environmental Protection: This summer I had the pleasure to work with Larry Tichenor the supervisor for the Madisonville regional office for the DEP. My duties were to go and conduct a waste tire retailer inspection on different tire retailers in our region. Our region included 12 counties which are, Muhlenberg, Daviess, McLean, Hopkins, Christian, Todd, Webster, Caldwell, Crittenden, Trigg, Union, Henderson.

Kailey Jensen, Puget Sound Estuarium: This summer I worked as an environmental educator and partook in animal husbandry duties for the Puget Sound Estuarium in Olympia, Washington. My main duties included tending to the organisms at the main facility and teaching the public/ school groups about biodiversity and anthropogenic impacts on the environment.



Shannon McCall, Woods and Water Land Trust: As an intern with the Woods and Water Land Trust, I spent most days traveling to various properties in Franklin County to remove invasive species. I also completed an individual project consisting of a composition and abundance survey to observe the effectiveness of land management practices.

Madison Moreno, Arizona Dept. of Water Resources: I worked as an Active Management Areas Intern in the Arizona Dept. of Water Resources. I conducted statistical analysis to create guidelines for reducing groundwater use in specific areas of the state.

Madison Mosher, UK Department of Forestry: This past Spring semester I had the opportunity to work with Dr. Chris Barton with his non-profit organization Green Forest Works. I was able to work on various tree planting events and to see what it was like to be a part of an organization such as this. Along with tree planting events, I was able to help a couple of graduate students involved with the Green Forest Works on their research projects. Some work included researching certain vegetation that is present on a West Virginia coal mine site, and analyzing data on the hydroperiods and vegetation on the wetlands also found in West Virginia.



Hattie Nunley, Maejo University, Thailand: This past summer I had the unique opportunity to travel to Northern Thailand to intern at Maejo University, the country's premiere agricultural institution. For 7 weeks I worked on the university's 350-acre diversified research farm

and attended lectures on a wide variety of sustainable agriculture topics, with the majority of my work focused on integrated pest and fertility management in organic systems, crop breeding, and food security initiatives.

Alumna Speaker: Amy Sohner is the Executive Director of Bluegrass Greensource, a Lexington-based community outreach organization that develops and promotes programs to improve water quality, waste management, and environmental education in the Central Kentucky region. She graduated from the NRES program (Natural Resource Conservation and Management) in 1999. Her background is in environmental education, and she now spends her time on Bluegrass Greensource program development, staff, and finance management.



Corby Smith, Aquatic Resources Management: I worked as a Whole Effluent Toxicity (WET) lab technician at Aquatic Resources Management in Lexington. I developed and practiced a wide variety of technical lab skills in a hands-on environment. In particular, I worked on indicator species culturing with fathead minnows.

Shannon Whitmer, Bay View Association Woods Committee: This summer I worked as an intern helping the Bay View Association Woods Committee. My main job was developing forest-related activities for kids age 7-14 in the local recreation program in order to get them more engaged with the woods. I also provided input during woods committee meetings as one of only two voices there under the age of 30.

Brianna Stanley, UK Psychology: I worked in the lab with Dr. Ellen Usher of UK's Psychology Dept. Our research project seeks to understand how people's self-efficacy and beliefs about their own capabilities affects their willingness to engage in pro-environmental behaviors. I worked primarily on a literature review to evaluate existing measures of self-efficacy.

Lauren Wilson, Fox Run Environmental Education Center: This summer, I had the opportunity to work as an intern with Ame Vanorio at Fox Run Environmental Education Center. Fox Run serves as a sustainable organic farm and a wildlife rehabilitation facility. My main duties were assisting with vaccinations, bottle feedings, cage cleaning, medication distribution, etc. In addition to this, I helped my supervisor, Ame, educate the public about the importance of caring for our environment.



Amy Susko, Raven Run Nature Sanctuary: This spring I worked as a seasonal intern with Raven Run Nature Sanctuary. My work mainly focused on community outreach through educational programs for the public. I often shadowed and helped run nature programs for people of all ages. Other duties included trail maintenance, mulching trees,

removing invasive species, making educational displays for the nature center, and anything else needed to make the park enjoyable for the public.

Elizabeth Winebarger, UK and the Girl Scouts of Kentuckiana: I worked on a research project to conduct a site analysis of the Bear Creek Aquatic Camp, where I had attended as a camper and later a counselor. I developed a number of digital maps to replace outdated hand-drawn maps. I also analyzed how various ecological factors impacted the camp and vice versa.

Kelly Walker, UK Food Connection: As an intern, I worked with Dr.s Lilian Breslin and Leigh Maynard to organize the first annual Local Kentucky Food Systems Summit. I also worked on an independent project to create short summary videos of the speakers at the event.

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2020 Internship Forum

NRES Internships and Research Experiences
October 29, 2020

 College of Agriculture,
Food and Environment

Schedule

Welcome and Introductions:

Dr. Christopher Matocha, NRES Chair
Dr. Adia R. Sovie, NRES Academic Coordinator

Poster Presentations for:

NRE 395 Research in Natural Resources
NRE 399 Internship in Natural Resources

Student Experiences

Noah Anthony, UK Department of Plant Pathology: Over the summer I got the opportunity to work with Dr. Nicole Gauthier and Desiree Szarka in the UK



Noah Anthony, UK Dept. of Plant Pathology

Department of Plant Pathology. Their study was over leaf spot disease on hemp plants and its impacts on biomass. Along with their research project I had one on my own topic determining if hemp is impacted or a carrier for *phytophthora* \square *nicotianae*, a disease influencing tobacco yield.

Katherine Duckworth, Lynnhaven River Now: This summer, I had the opportunity to work as an environmental education intern with Lynnhaven River Now in Virginia Beach, Virginia. With the assistance of longtime staff members, I learned to develop curriculum and activities for a preschool program for 3 to 5-year-olds. Creativity and flexibility were



Katherine Duckworth, Lynnhaven River Now

essential when planning activities, since the program needed to be redesigned in a “take-home” format due to the pandemic.

Ashley Ginsburg, SC Department of Natural Resources: This past summer I had the opportunity to work with Hilton Head Island Sea Turtle Patrol and marine biologist Amber Kuehn. Our duties required us to patrol 12-miles of coastline looking for sea turtle tracks or turtles in distress. We also worked to educate locals and visitors coming to the island about the importance of protecting sea turtles, why picking up after yourself was important, and how marine wildlife and the oceans are important ecosystems for our world



Ashley Ginsburg, SC Department of Natural Resources

Joey Gordon, UK Department of Plant and Soil Sciences: From Fall 2019 to the Spring of 2020 I had the opportunity to work in the labs of Dr. David McNear (Rhizosphere Science) and Dr. Chris Shepard (Critical Zone Pedology). The purpose of my work was to assist Dr. McNear with the creation of soil monolith models of common soil types of the Bluegrass. In the Critical Zone Pedology lab I assisted with the chemical analysis of the Maury soil type. This analysis would be paired with compositions of the soil as the depth increases.



Lauren Myfelt, Daniel Boone NF

Lauren Myfelt, Daniel Boone National Forest: This past summer, I worked as an intern backcountry ranger in the Cumberland Ranger District of the Daniel Boone National Forest. During my time there, I patrolled the trail system, maintained trails through crosscut and chainsaw work, and cleaned campsites and the Red River. I also assisted a Southern Appalachian Wilderness Steward with data collection on campsites and rock shelters within the Clifty Wilderness

Claire Hilbrecht, UK Special Collections Research Library: Last year, I had the opportunity to intern with the Special Collections Research Library through the Learning Lab program. I archived and conducted research on the Cathy Wilson Collection on the Red River Gorge (1975-1976). The collection contained newspaper clippings, correspondence, and other documents regarding efforts to save the Red River Gorge from the damming of the Red River, which would have flooded the area.

Gracie Sandlin, The Kentucky Children's Garden: I had the opportunity to work as an assistant educator at the Kentucky Children's Garden at the UK Arboretum. The Kentucky Children's Garden provides a space where children can freely (under supervision) explore the different landscapes Kentucky has to offer. My work was mainly focused on tending to the various gardens and conducting daily educational programs that were focused around the garden and the environment, while making sure every visitor had a great experience.

Kayla Combs, University of Kentucky: I had the opportunity to work with Dr. Adia Sovie during the fall 2020 semester. We worked on an applied ecology project with implications for wildlife conservation and management in the Southeast. We used data to assess the role of oak hammocks in maintaining biodiversity in the imperiled Longleaf Pine ecosystem.

Jake Simanek, UK Department of Earth and Environmental Science: My research has been conducted with Dr. Kevin Yeager in the EES department. My research focuses on micro plastics, defined by NOAA as any petroleum derived polymer less than 5mm in any dimension. I selected nine sites across campus and took seven soil samples from each of them. My goal is to quantify the amount of micro plastics in each sample to determine if the variation among sites is significantly different than the variation between samples from the same site.



Pat Tillson, LFUCG

Pat Tillson, Lexington-Fayette Urban County Government. I worked as a Dry Weather Screener for the LFUCG Division of Water Quality, Compliance and Monitoring in Lexington Kentucky. My main duties were to find flowing storm water outfalls and sample the water to test a number of parameters in order to identify potential sources of pollution.

Ellie Moore, Campus Kitchen at the University of Kentucky: Over the course of the summer, I was employed through the university as a garden intern. My primary responsibility was to plant, maintain, harvest, and record data for a garden at the Arbor Youth Services building.

Stacy Gadd, Price Labs, UK Department of Forestry and Natural Resources: I worked with Dr. Price to analyzing data collected on plethodontid salamander diets in KY. I also worked with Dr. Price and his lab on some ongoing research into salamander dispersal habits in Robinson Forest the summer of 2019.

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KentuckyNRES



Dr. Mary A. Arthur

College of Agriculture, Food and Environment
Department of Forestry
2016-2021 CV for Annual Performance Review

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

Published

Journal Article, Academic Journal

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Scopus Metric Year: 2019 | CiteScore: 1.1 | SNIP: 0.544 | SJR: 0.315
Author Role:Oversaw conception, design, implementation, analysis, writing, submission
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- Yang, Y., Yanai, R. D., See, C. R., Arthur, M. A. (2017). Sampling effort and uncertainty in leaf litterfall mass and nutrient flux in northern hardwood forests, *ECOSPHERE*, 8(11). doi: 10.1002/ecs2.1999 | JIF: 2.490
- Arthur, M. A., Weathers, K. C., Lovett, G. M., Weand, M. P., Eddy, W. C. (2017). A beech bark disease induced change in tree species composition influences forest floor acid-base chemistry, *CANADIAN JOURNAL OF FOREST RESEARCH*, 47(7), 875-882. doi: 10.1139/cjfr-2016-0341
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- Varner, J. M., Arthur, M. A., Clark, S. L., Dey, D. C., Hart, J. L., Schweitzer, C. J. (2016). FIRE IN EASTERN NORTH AMERICAN OAK ECOSYSTEMS: FILLING THE GAPS, *FIRE ECOLOGY*, 12(2), 1-6. doi: 10.4996/fireecology.1202001
- Crowley, K. F., Lovett, G. M., Arthur, M. A., Weathers, K. C. (2016). Long-term effects of pest-induced tree species change on carbon and nitrogen cycling in northeastern US forests: A modeling analysis, *FOREST ECOLOGY AND MANAGEMENT*, 372, 269-290. doi: 10.1016/j.foreco.2016.03.045

Mattingly, K. Z., McEwan, R. W., Paratley, R., Bray, S. R., Lempke, J. R., Arthur, M. A. (2016). Recovery of forest floor diversity after removal of the nonnative, invasive plant *Euonymus fortunei*, *JOURNAL OF THE TORREY BOTANICAL SOCIETY*, 143(2), 103-116. doi: 10.3159/TORREY-D-14-00051

Accepted

Book, Chapter

* Arthur, M. A. Date Accepted: (October, 2020). Fire ecology and management in eastern broadleaf and Appalachian forests., *Past Present and Future Fire Ecology and management Across US Forested Ecosystems*. Springer-Nature.

Journal Article, Academic Journal

* + Black, D. E., + Poynter, Z. W., Cotton, C. A., + Upadhaya, S., Taylor, D. D., Leuenberger, W., Blankenship, B. A., Arthur, M. A. Date Accepted: (2018). Post-wildfire recovery of an upland oak-pine forest on the Cumberland Plateau, Kentucky.. *FIRE ECOLOGY*.

+ Black, D. E., Arthur, M. A., Taylor, D. D., Lewis, J. F., Leuenberger, W. Date Accepted: (October, 2018). Using mastication to support woodland restoration in upland oak forests on the Cumberland Plateau, Kentucky. *Forest Science*.

* Rieseke, L., Borden, S., ^ Damron, B., Williamson, N., Arthur, M. A., Kinney, A. Date Accepted: (September, 2018). College campus as a living laboratory: Scrubbing scales, saving trees, engaging students.. *AMERICAN ENTOMOLOGIST*.

* + Rounsaville, T. J., Baskin, C. C., Roemmele, E., Arthur, M. A. Date Accepted: (April, 2018). Seed dispersal and site characteristics influence germination and seedling survival of the invasive liana *Euonymus fortunei* (wintercreeper) in a rural woodland.. *Canadian Journal of Forest Research*.

Sponsored Projects

Awarded

Crocker E., V., Arthur M., A., Rieseke-Kinney L., K., Sass C., K., Williams M., A., Undergraduate Certificate In Urban And Community Forestry, Sponsored by National Institute of Food and Agriculture Submitted: June 11, 2017. Funding Dates: April 1, 2018 - March 31, 2022. Requested: \$150,000.00, | Awarded: \$150,000.00
OSPA ID: 201706111021

Sass C., K., Rieseke-Kinney L., K., Arthur M., A., Urban Forest Initiative, Sponsored by KY Division of Forestry Submitted: October 13, 2020. Funding Dates: December 1, 2020 - June 30, 2021. | Awarded: \$10,000.00
OSPA ID: 202010131420

Closed

Arthur M., A., Rieseke-Kinney L., K., Urban Forest Initiative, Sponsored by KY Energy and Environment Cabinet Submitted: July 26, 2019. Funding Dates: August 1, 2019 - June 30, 2020. | Awarded: \$10,000.00
OSPA ID: 201907261020

Arthur M., A., Daniel Boone National Forest and Triplett Creek Landscape Restoration

Partnership, Sponsored by Forest Service Submitted: May 20, 2015. Funding Dates: June 26, 2015 - June 1, 2020. | Awarded: \$93,000.00

OSPA ID: 201505201530

Arthur M., A., Rieske-Kinney L., K., The Urban Forest Initiative: Educating the Public to Connect Urban Trees to Stormwater Quality and Quantity, Sponsored by Lexington Fayette Urban County Government Submitted: May 12, 2017. Funding Dates: March 22, 2018 - September 22, 2019. | Awarded: \$34,954.00

OSPA ID: 201705121012

Rieske-Kinney L., K., Arthur M., A., Urban Forestry Initiative with KY Communities, Sponsored by KY Division of Forestry Submitted: May 26, 2016. Funding Dates: July 1, 2016 - June 30, 2017. | Awarded: \$18,520.00

OSPA ID: 201605261227

Rieske-Kinney L., K., Arthur M., A., Urban Forestry Initiative with KY Communities, Sponsored by KY Division of Forestry Submitted: March 30, 2016. Funding Dates: May 1, 2016 - June 30, 2016. | Awarded: \$1,480.00

OSPA ID: 201603301408

Non-Sponsored Projects

Federal

McIntire-Stennis

Closed

Arthur, M. A., Using remotely-sensed data to evaluate post-fire vegetation and fuel dynamics in central and Appalachian hardwood forests, National Institute of Food and Agriculture, (October 1, 2011 - September 30, 2016).

On-going

Arthur, M. A., The oak-fire hypothesis: using fire to manage oak forest ecosystems in the central and southern Appalachians, National Institute of Food and Agriculture, (December 20, 2016 - September 30, 2021).

State

On-going

Rieske-Kinney, L. K. (Co-Principal), Arthur, M. A. (Co-Principal), Sass, C. K. (Co-Principal), Conservation, protection, and enhancement of forest canopies in rural communities and small municipalities., Kentucky Division of Forestry, (December 1, 2020 - June 30, 2023). Awarded: \$406339.

Description: In addition to the co-PIs there are ~12 other UK faculty and staff on the project, all of whom contributed effort with their salary to allow us to make the 1:1 match that the funding agency required.

Arthur, M. A. (Principal), Rieske-Kinney, L. K. (Co-Principal), Modeling replicable urban and community forestry programs in Kentucky, Kentucky Division of Forestry, KY Energy and Environment Cabinet, (December 1, 2020 - June 30, 2021). Awarded: \$10000.

University

Closed

Arthur, M. A. (Principal), Rieske-Kinney, L. K. (Co-Principal), Crocker, E. V. (Co-Principal), Williamson, N. (Co-Principal), Training Collegiate Arborist Teams (TreeCATS) to expand the visibility of urban tree benefits, UK Sustainability Challenge Grant program, (January 1, 2019 - December 31, 2019). Awarded: \$35000.

Description: Proposal pending to the UK Sustainability Challenge Grant program.

Arthur, M. A. (Co-Principal), Rieske-Kinney, L. K. (Co-Principal), Williamson, N. (Co-Investigator), Mobilizing tree ambassadors through campus and community engagement, teaching and research, UK Sustainability Challenge Grant program, (January 1, 2017 - December 31, 2017). Awarded: \$49774.

On-going

Arthur, M. A. (Principal), Sass, C. K. (Co-Principal), Rieske-Kinney, L. K. (Co-Principal), Williamson, N. (Collaborator), Preparing our Urban Forests for our Changing Climate, UK Sustainability Challenge Grant Program, (May 1, 2020 - December 31, 2021). Awarded: \$15500.

Arthur, M. A. (Collaborator), Sass, C. K. (Collaborator), Rieske-Kinney, L. K. (Collaborator), Williamson, N. (Collaborator), Eades, A. (Collaborator), Hilbrecht, C. (Undergrad Student), TreeCATs: Collegiate Arborist Team and Training Workshop, UK Student Sustainability Council, (January 1, 2021 - September 30, 2021). Awarded: \$13942.

Description: The proposed TreeCATs program has two components, a 20-hour workshop and a summer internship. The workshop will unfold over four consecutive Saturdays during the spring 2021 semester, with 20 total hours of cumulative instruction (delivery of content in light of COVID-19 mentioned in greater detail below). The workshop will provide 12 UK students with hands-on knowledge of the importance of maintaining urban forest canopy cover, and skills that can be applied in the fields of urban forestry, land management, urban planning and design, environmental education, human health and wellness, and landscape architecture. By the end of the workshop, students will have a rich understanding of the ecological functions of urban forests, how to manage these forest systems, and how to navigate tools and software relevant to urban forestry. The material will be taught through a combination of lectures led by members of the UFI core team, guest speakers, field trips, and hands-on experience. The curriculum will be a collaboration among experts in urban forestry, forest ecology, entomology, landscape architecture and arboriculture. The 12 participants in the TreeCATs workshop will be selected via an online application that includes questions regarding the student's appreciation for healthy urban forests and their plans to use the information they will gain in their careers and other endeavors. Each participant who attends all workshop sessions will receive a \$200 stipend at the completion of the workshop. Our experience has shown that the stipend incentivizes participation and promotes the understanding that the knowledge that these students will gain is an investment that will offer benefits to the UK campus, the Lexington community, and wherever the participants may work throughout their careers.

Arthur, M. A., Rieske-Kinney, L. K. (Co-Principal), Williamson, N. (Co-Investigator), From Roots to Branches: Expanding UK's capacity to care for and nurture urban forests and their people, UK Sustainability Challenge Grant program, (January 1, 2018 - December 31, 2018). Awarded: \$38898.

Presentations Given

Arthur M. A., (May 7, 2019). All day presentation and field trip: Fire Ecology in Upland Hardwood Systems/Fire Effects in Mixed-Oak Stands National Advance Silviculture Program Training. Invited, National.

Invited Speaker

Arthur M. A., (September 23, 2020). Fire effects from Fish Trap Wildfire in Red River Gorge Kentucky Prescribed Fire Council/Annual Meeting, Kentucky Prescribed Fire Council, KY, United States. Invited, State.

Keynote or plenary address

Arthur M. A., (June 3, 2019). The Blind (Wo)Men and the Elephant: A parable for ecosystem ecology? William H. Martin Appalachian Research Symposium, Eastern Kentucky University, United States. Invited, Regional.

Poster Session

Crocker E. V., Williamson N., Arthur M. A., Rieske-Kinney L. K., Sass C. K., (May 21, 2019). New undergraduate certificate in urban and community forestry at the University of Kentucky Arboriculture & Urban Forestry Educators Symposium, Morton Arboretum, International Society of Arborists, Lisle, IL. Accepted, National.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
FOR 340 - 001	4.00000 - 4.00000	28	10 Fall 2020-2021
FOR 340 - 002	4.00000 - 4.00000	21	10 Fall 2020-2021
PLS 749 - 011	0.00000 - 0.00000	1	50 Summer 2019-2020
FOR 748 - 001	0.00000 - 0.00000	1	30 Spring 2019-2020
PLS 767 - 033	2.00000 - 2.00000	1	30 Spring 2019-2020

FOR 340 - 001	4.00000 - 4.00000	22	10 Fall 2019-2020
FOR 340 - 002	4.00000 - 4.00000	21	10 Fall 2019-2020
FOR 768 - 001	1.00000 - 6.00000	1	10 Fall 2019-2020
PLS 767 - 022	2.00000 - 2.00000	1	10 Fall 2019-2020
FOR 770 - 001	1.00000 - 1.00000	8	30 Spring 2018-2019
PLS 767 - 033	2.00000 - 2.00000	1	30 Spring 2018-2019
EXP 396 - 028	1.00000 - 12.00000	1	10 Fall 2018-2019
FOR 340 - 001	4.00000 - 4.00000	25	10 Fall 2018-2019
FOR 340 - 002	4.00000 - 4.00000	25	10 Fall 2018-2019
NRE 201 - 001	3.00000 - 3.00000	30	10 Fall 2018-2019
PLS 767 - 022	2.00000 - 2.00000	1	10 Fall 2018-2019
EXP 396 - 073	1.00000 - 12.00000	1	30 Spring 2017-2018
FOR 340 - 001	4.00000 - 4.00000	31	10 Fall 2017-2018
FOR 340 - 002	4.00000 - 4.00000	28	10 Fall 2017-2018
NRE 201 - 001	3.00000 - 3.00000	38	10 Fall 2017-2018
NRE 399 - 002	3.00000 - 3.00000	1	10 Fall 2017-2018
PLS 767 - 022	2.00000 - 2.00000	1	10 Fall 2017-2018
BIO 767 - 029	2.00000 - 2.00000	1	30 Spring 2016-2017
FOR 748 - 001	0.00000 - 0.00000	2	30 Spring 2016-2017
NRE 399 - 002	1.00000 - 6.00000	1	30 Spring 2016-2017
PLS 767 - 033	2.00000 - 2.00000	1	30 Spring 2016-2017
BIO 767 - 029	2.00000 - 2.00000	1	10 Fall 2016-2017
FOR 340 - 001	4.00000 - 4.00000	19	10 Fall 2016-2017
FOR 340 - 002	4.00000 - 4.00000	12	10 Fall 2016-2017
FOR 791 - 001	1.00000 - 3.00000	2	10 Fall 2016-2017
NRE 399 - 002	1.00000 - 6.00000	2	10 Fall 2016-2017
PLS 767 - 022	2.00000 - 2.00000	1	10 Fall 2016-2017
BIO 767 - 029	2.00000 - 2.00000	1	30 Spring 2015-2016
EXP 396 - 005	1.00000 - 12.00000	1	30 Spring 2015-2016
NRE 399 - 002	1.00000 - 6.00000	1	30 Spring 2015-2016
NRE 471 - 001	4.00000 - 4.00000	13	30 Spring 2015-2016
PLS 767 - 033	2.00000 - 2.00000	1	30 Spring 2015-2016
UK 100 - 003	1.00000 - 3.00000	8	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
FOR 340 - 001	24	3.83	3.88	10 Fall 2020-2021
FOR 340 - 001	21	4.29	4.05	10 Fall 2019-2020
FOR 340 - 001	24	3.74	3.83	10 Fall 2018-2019
FOR 340 - 001	24	3.70	3.83	10 Fall 2017-2018
FOR 340 - 001	19	4.47	4.58	10 Fall 2016-2017
FOR 340 - 002	19	4.16	4.16	10 Fall 2020-2021

FOR 340 - 002	21	4.52	4.71	10 Fall 2019-2020
FOR 340 - 002	23	3.91	3.87	10 Fall 2018-2019
FOR 340 - 002	27	4.33	4.56	10 Fall 2017-2018
FOR 340 - 002	11	4.64	4.73	10 Fall 2016-2017
FOR 770 - 001	7	4.43	4.43	30 Spring 2018-2019
NRE 201 - 001	29	4.07	4.34	10 Fall 2018-2019
NRE 201 - 001	27	3.96	4.44	10 Fall 2017-2018
NRE 471 - 001	8	3.50	4.00	30 Spring 2015-2016
UK 100 - 003	8	3.50	3.38	30 Spring 2015-2016

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Dissertation Committee Chair

Zhijie Yang, IPSS, "Plant-soil Interactions Dominate Soil Microbial Respiration and Soil Organic Carbon Sequestration in a Subtropical Moist Evergreen Broadleaved Forest in China.," Status: Degree Awarded, Expected Completion Date: May 2019. (August 2014 - December 2020).

Todd Rounsaville, Biology, "Invasion dynamics of the exotic liana *Euonymus fortunei* (Turcz.) Hand.-Mazz. (wintercreeper)," Status: Degree Awarded. (May 2017).

Dissertation Committee Member

Bobby Lee, Education, "Comparing two-year colleges under a common sustainable development framework: personal networks and perspectives," Status: In-Process, Expected Completion Date: November 2018. (September 2015 - December 2018).

Master's Thesis Committee Chair

Jordan Winkenbach, "The Role of Fire and a Fire-free Interval in the Restoration of Upland Oak Communities on the Cumberland Plateau, Kentucky.," Status: Degree Awarded, Expected Completion Date: May 2020. (April 2018 - May 2020).

Devin Black, Forest and Natural Resource Sciences, "Managing upland oak forests with disturbance and the implications for non-native species invasions.," Status: Degree Awarded. (May 2017).

Zachary Poynter, Forest and Natural Resource Sciences, "Vegetation response to repeated prescribed burning and varied wildfire severity in upland forests on the Cumberland Plateau, Kentucky," Status: Degree Awarded. (May 2017).

Directed Student Learning (excluding theses, dissertations)

Claire Hilbrecht. Directed Individual/Independent Study. . In-Process (January 2020 - May 2021).
Description: Serve on Gaines thesis advisory committee for Claire Hilbrecht, Fellow in the Gaines Fellowship in the Humanities program.

Brianna Damron. Directed Individual/Independent Study. *Mindfulness-based nature therapy for hospitalized patients with acute pain*. In-Process (May 15, 2018 - May 2019).
Description: Brianna Damron developed a research project aimed at examining the potential for nature therapy delivered virtually to a patients hospital room to reduce the perception of pain.

Dominik Tye. Directed Individual/Independent Study. *Growing Voices: A collection of oral histories to unveil underrepresented perspectives on greening initiatives in the East End Neighborhood of Lexington*. In-Process (May 15, 2018 - December 2018).
Description: Dominik Tye, with funding from a Summer Sustainability Research Fellowship conducted a listening project with key informers in the East End neighborhood of Lexington to learn about their relationships to trees and urban greenspace.

Bryan Kist. Mentor. *TreeCATs*. In-Process (May 15, 2018 - December 15, 2018).
Description: Mentored summer intern working with the Urban Forest Initiative

Brianna Damron. Mentor. . In-Process (May 15, 2016 - December 15, 2018).
Description: Mentored student in the development of nature therapy/mindfulness activities connected to trees, on UK campus

Kathleen Kilcoyne. Mentor. . Completed (May 15, 2018 - August 15, 2018).
Description: Summer intern with the Urban Forest Initiative Team

Academic Advising

10 Fall 2020-2021, 12 undergraduate students advised, 1 graduate student advised.

30 Spring 2019-2020, 10 undergraduate students advised, 80 professional students advised.

10 Fall 2019-2020, 20 undergraduate students advised, 2 graduate student advised, Undergraduate Students, Graduate Students, and Undergraduate Student Research.

30 Spring 2018-2019, 10 undergraduate students advised, 2 graduate student advised, 45 professional students advised.

10 Fall 2018-2019, 10 undergraduate students advised, 2 graduate student advised, 1 interns and residents advised.

10 Fall 2017-2018, 20 undergraduate students advised, 2 graduate student advised, Undergraduate and Graduate Students.

10 Fall 2016-2017, 10 undergraduate students advised, 2 graduate student advised, Undergraduate and Graduate Students.

Program and Curriculum Development

2017

Program/Curriculum Name - Urban and Community Forestry undergraduate certificate development

Description: Contributed to conceptualizing and developing a successful submission of a USDA Higher Education Challenge Grant to support development of an undergraduate certificate in urban and community forestry.

2018

Program/Curriculum Name - Co-Lead, Urban Forest Initiative Working Group. 2014 to present

Description: Co-lead the Urban Forest Initiative Working Group, a collaborator group of faculty, staff, students, and professionals from multiple organizations who work together to create awareness and activity around the development of the urban forest.

Program/Curriculum Name - Tree Week Planning Committee; January 2018 to October 2018.

Co-led this with Dr. Lynne Rieske-Kinney, Nic Williamson, Bridget Abernathy of KDF Urban Forestry, and Heather Wilson of LFUCG Urban Forestry.

Description: Tree Week is a week-long event with more than 60 tree-related activities offered by multiple organizations for people of all ages to highlight the urban forest and engage people about it.

Program/Curriculum Name - Urban Forest Initiative Team. 2014-present. Co-lead this team of staff and undergraduate student interns with Dr. Lynne Rieske-Kinney.

Description: We support a team of 2 staff and 3-4 undergraduate interns to develop urban and community forestry programming throughout Fayette County and beyond.

Program/Curriculum Name - Urban and Community Forestry undergraduate certificate development

Description: Upon receipt of an USDA Higher Education Challenge Grant, worked to develop the certificate; ongoing

2019

Program/Curriculum Name - Urban and Community Forestry undergraduate certificate development

Description: Upon receipt of an USDA Higher Education Challenge Grant, (Crocker, PI) worked to develop the certificate in collaboration with a group of faculty from across UK; ongoing

Program/Curriculum Name - Urban Forest Initiative (UFI) Team. 2014-present. Co-lead this team of staff and undergraduate student interns with Dr. Lynne Rieske-Kinney and Dr. Chris Sass.

Description: We support a team of 2 staff and 3-4 undergraduate interns with funding from various sources (including TFISE, Student Sustainability Council, Sustainability Challenge Grant program, Kentucky Division of Forestry, and LFUCG) to develop urban and community forestry programming throughout Fayette County and beyond.

Program/Curriculum Name - Tree Week Planning Committee; March 2019 to November 2019.

Co-led Nic Williamson, Bridget Abernathy of KDF Urban Forestry, Heather Wilson of LFUCG Urban Forestry, Chris Sass, and Lynne Rieske-Kinney.

Description: Tree Week is a week-long event with more than 60 tree-related activities offered by multiple organizations for people of all ages to highlight the urban forest and engage people about it.

Program/Curriculum Name - Co-Lead, Urban Forest Initiative Working Group. 2014 to present

Description: Co-lead the Urban Forest Initiative Working Group, a collaborative group of faculty, staff, students, and professionals from multiple organizations who work together to create awareness and activity around the development of the urban forest.

2020

Program/Curriculum Name - Urban and Community Forestry undergraduate certificate development

Description: Upon receipt of an USDA Higher Education Challenge Grant, (Crocker, PI) worked to develop the certificate in collaboration with a group of faculty from across UK; ongoing

Program/Curriculum Name - Urban Forest Initiative (UFI) Team. 2014-present. Co-lead this team of staff and undergraduate student interns with Dr. Lynne Rieske-Kinney and Dr. Chris Sass.

Description: We support a team of 2 staff and 3-4 undergraduate interns with funding from various sources (including TFISE, Student Sustainability Council, Sustainability Challenge Grant program, and Kentucky Division of Forestry) to develop urban and community forestry programming throughout Fayette County and beyond.

Program/Curriculum Name - Tree Week Planning Committee; March 2020 to November 2020.

Co-led Nic Williamson, Bridget Abernathy of KDF Urban Forestry, Heather Wilson of LFUCG Urban Forestry, Allison Eades (UFI staff), Chris Sass, and Lynne Rieske-Kinney.

Description: This year's tree Week event pivoted to online and physically-distanced events sponsored by multiple organizations for people of all ages to highlight the urban forest

and engage people about it. There were ~40 events in 2020, plus satellite events in Berea and Hazard.

Program/Curriculum Name - Co-Lead, Urban Forest Initiative Working Group. 2014 to present
Description: Co-lead the Urban Forest Initiative Working Group, a collaborative group of faculty, staff, students, and professionals from multiple organizations who work together to create awareness and activity around the development of the urban forest.

Service

Department Service

Committee Member

Graduate Committee, (2017 - 2019).

College Service

Committee Chair

Natural Resources and Environmental Science Steering Committee, (2009 - December 2019).

Committee Member

Promotion and Tenure Committee, (2017 - 2018).

Reviewer

Carrie Casner Fellowship, (2017).

University Service

Committee Member

Extension Series Area Committee, alternate, (2019 - 2021).

Casner Fellowship application review, (2020).

Professional Service

Editor, Associate Editor

Canadian Journal of Forest Research, Served as AE for 16 manuscripts in 2019-2020, (January 2017 - Present).

Advisory Board Member

USDA-USDI Joint Fire Science Program-funded Consortium of Appalachian Fire Managers and Scientists, (2015 - 2018).

Program Coordinator

Urban Forest Initiative, Co-Lead, Urban Forest Initiative Working Group. 2014 to present
Description: Co-lead the Urban Forest Initiative Working Group, a collaborator group of faculty, staff, students, and professionals from multiple organizations who work together to

create awareness and activity around the development of the urban forest., (August 2014 - Present).

Reviewer, Ad Hoc Reviewer

Peer-reviewed journals, Reviewed 15 manuscripts, 2019-2020, (2019 - 2020).

Promotion and Tenure review - external, External reviewer for P&T dossiers, 1 in 2019, 2 in 2020, (2019 - 2020).

Reviewer, Book

Book prospectus reviews, Reviewer for two book prospectuses during period of review, 2019-2020, (2019 - 2020).

Reviewer, External Program

National Science Foundation, Grant review panel, (November 20, 2019 - November 22, 2019).

Professional Development

Awards and Honors

Career Achievement Award, Eastern Fire and Oak Forest Conference Convening Committee.
Scholarship/Research/Creative, Recognition Award, Regional. (July 24, 2019 - Present).

Dr. Christopher D. Barton

College of Agriculture, Food and Environment
Department of Forestry
2016-2021 CV for Annual Performance Review

Administrative Assignments

Director. July 1, 2015 - June 30, 2018

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites

SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

Published

Book, Chapter

Barton, C. D. (2020). Chapter 8. Facilitated Transport of Zinc on Plastic Colloids Through Soil Columns. *Particulate Plastics in Terrestrial and Aquatic Environments* Boca Raton, FL, CRC Press, 127-135.

Author Role: Barton: Conducted experiments, analyzed data, wrote chapter.

* Barton, C. D., Sena, K., Angel, P. (2018). Reforestation Can Contribute to a Regenerative Economy in Global Mining Regions. *Global Mountain Regions: Conversations Toward the Future*. Bloomington, IN, Indiana University Press, 343-354.

Barton, C. D. (2017). Forward to Spoil to Soil: Mine Site Rehabilitation and Revegetation. *Spoil to Soil: Mine Site Rehabilitation and Revegetation*, Taylor and Francis.

Barton, C. D., Witt, E., Stringer, J. (2017). Protecting Water Resources with Streamside Management Zones at Robinson Forest. *Water in Kentucky* Lexington, KY, University Press of Kentucky, 81-87.

Agouridis, C. T., Barton, C. D., Warner, R. C. (2017). Recreating a headwater stream system on a valley fill in the Appalachian coal field. *Spoil to Soil: Mine Site Rehabilitation and Revegetation* Abingdon, Taylor and Francis, 147-174.

Barton, C. D., + Sena, K., ^ Dolan, T., Angel, P., Zipper, C. (2017). Restoring forests on surface coal mines in Appalachia: A regional Reforestation approach with global application. *Spoil to Soil: Mine Site Rehabilitation and Revegetation* Abingdon, Taylor and Francis, 124-145.

Book, Chapter in Scholarly Book-New

Barton, C. D., Witt, E. L., Stringer, J. W. (2017). Protecting water resources with streamside management zones at robinson forest *Water in Kentucky: Natural History, Communities, and Conservation*, 81-87.

Agouridis, C. T., Barton, C. D., Warner, R. C. (2017). Recreating a headwater stream system on a valley fill in appalachia, USA *Spoil to Soil: Mine Site Rehabilitation and Revegetation*, 147-174. doi: 10.1201/9781351247337

Journal Article

Williamson, T. N., Barton, C. D. (2020). Hydrologic modeling to examine the influence of the forestry reclamation approach and climate change on mineland hydrology, *Science of the Total Environment*, 743, 13. doi: doi.org/10.1016/j.scitotenv.2020.140605

+ Hutton, J. M., Price, S. J., Bonner, S. J., Richter, S. C., Barton, C. D. (2020). Occupancy and Abundance of Stream Salamanders Along a Specific Conductance Gradient., *Freshwater Science*, 39(3). doi: 10.1086/709688

Author Role:

Designed the study

Conducted some field work

Analyzed the data

Wrote the manuscript with help from the graduate student

+ Branduzzi, A. M., Barton, C. D., Lovell, A. (2020). First-Year Survival of Native Wetland Plants in Created Vernal Pools on an Appalachian Surface Mine, *Ecological Restoration*, 38(2), 70-73. doi: doi:10.3368/er.38.2.70

Tyree, M., Larkin, J., Eggerud, S., Angel, P., French, M., Barton, C. D. (2018). Flight 93 National Memorial reforestation project: Survival and health of native woody plants established on reclaimed mineland. Lexington, KY, *Journal of the American Society of Mining and Reclamation*, 7(2), 35-60. doi: dx.doi.org/10.21000/JASMR18020035

+ Sena, K., Crocker, E., Vincelli, P., Barton, C. D. (2018). *Phytophthora cinnamomi* as a driver of forest change: Implications for conservation and management., *Forest Ecology and Management*, 409, 799-807.

+ Sena, K., Yeager, K., Dreaden, T., Barton, C. D. (2018). *Phytophthora cinnamomi* Colonized Reclaimed Surface Mined Sites in Eastern Kentucky: Implications for the Restoration of Susceptible Species. *Forests*, *Forests*, 9. doi: doi:10.3390/f9040203

+ French, M., * Barton, C. D., Brian, M., + Carolyn, K., Jeff, S., Barton, C. (2018). Re-establishing American chestnut on mined lands in the Appalachian coalfields. Lexington, *Journal of Environmental Solutions for Oil, Gas and Mining*, 4(1), 11-19.

Author Role: Part of Master's thesis and post-graduation work.

Directed French in graduate school. Initiated much of the research, field data and analysis and writing

field research, writing

Student of McCarthy's. Field research, data analysis, writing

Field research, data analysis, writing
Field analysis, data analysis, writing

Sena, K. L., Agouridis, C. T., Miller, J., Barton, C. D. (2018). Spoil type influences soil genesis and forest development on Appalachian surface coal mine ten years after placement, *Forests*, 9(12), 12. doi: doi:10.3390/f9120780

+ Sena, K., Dreaden, T., Crocker, E., Barton, C. D. (2018). Detection of Phytophthora cinnamomi in forest soils by PCR on DNA extracted from leaf disc baits., *Plant Health Progress*, 193-200. doi: doi:10.1094/PHP-01-18-0004-RS

Drayer, A., + Sena, K., Barton, C. D., Andrews, D. (2017). Long-term Response of Stream and Riparian Restoration at Wilson Creek, Kentucky USA. Ecological Restoration, *Ecological Restoration*, 35(3), 246-254.

Daniels, L., Zipper, C., Orndorff, Z., Skousen, J., Barton, C. D., McDonald, L. (2016). Predicting total dissolved solids release from central Appalachian coal mine spoils., *Environmental Pollution*, 216, 371-379. doi: dx.doi.org/10.1016/j.envpol.2016.05.044

Journal Article, Academic Journal

Bowker, D., Stringer, J. W., Barton, C. D. (2020). Influence of timber harvesting operations and streamside management zone effectiveness on sediment delivery to headwater streams in appalachia, *Forests*, 11(6). doi: 10.3390/F11060623

Castillo-Meza, L. E., Cravotta, C. A., Tasker, T. L., Warner, N. R., Daniels, W. L., Orndorff, Z. W., Bergstresser, T., Douglass, A., Kimble, G., Streczywilk, J., Barton, C. D., Fulton, S., Thompson, A. I., Burgos, W. D. (2020). Batch extraction method to estimate total dissolved solids (TDS) release from coal refuse and overburden, *Applied Geochemistry*, 115. doi: 10.1016/j.apgeochem.2020.104540

Sena, K., Metzmeier, J., Smith, B. C., Hansen, B., Barton, C. (2020). Climate Change and Invasive Species: Challenges and Opportunities for Forest Establishment on Appalachian Surface Mines, *Journal of Sustainable Forestry*. doi: 10.1080/10549811.2020.1768872

+ Dement, W. T., Hackworth, Z. J., Lhotka, J. M., Barton, C. D. (2020). Plantation development and colonization of woody species in response to post-mining spoil preparation methods, *New Forests*. doi: 10.1007/s11056-019-09769-y

+ Sena, K. L., Yang, J., Kohlbrand, A. J., Dreaden, T. J., * Barton, C. D. (2019). Landscape variables influence Phytophthora cinnamomi distribution within a forested Kentucky watershed, *Forest Ecology and Management*, 436, 39--44.

WOS Metric Year: 2019 | Category:FORESTRY | JIF: 3.17 | Rank by JIF: 5/68

Author Role:

Conducted landscape-scale analysis of the field data, helped synthesize the results and write the paper, served on the PhD committee

- Hall, S. L., Barton, C. D., Sena, K. L., Angel, P. (2019). Reforesting appalachian surface mines from seed: A five-year black walnut pilot study, *Forests*, 10(7). doi: 10.3390/f10070573
- Fritz, K. M., Pond, G. J., Johnson, B. R., Barton, C. D. (2019). Coarse particulate organic matter dynamics in ephemeral tributaries of a Central Appalachian stream network, *Ecosphere*, 10(3). doi: 10.1002/ecs2.2654
- Fletcher, D. E., Lindell, A. H., Seaman, J. C., Stankus, P. T., Fletcher, N. D., Barton, C. D., Biemiller, R. A., McArthur, J. V. (2019). Sediment and biota trace element distribution in streams disturbed by upland industrial activity, *Environmental Toxicology and Chemistry*, 38(1), 115-131. doi: 10.1002/etc.4287
- * Price, S. J., + Freytag, S. B., Bonner, S. J., + Muncy, B., Drayer, A., + Hutton, J., Barton, C. D. (2018). Mountaintop removal mining alters stream salamander population dynamics., *Diversity and Distributions*, 24(1242-1251). doi: 10.1111/ddi.12760
| JIF: 4.391
- Sena, K., Agouridis, C. T., Miller, J., Barton, C. (2018). Spoil type influences soil genesis and forest development on an appalachian surface coal mine ten years after placement, *Forests*, 9(12). doi: 10.3390/f9120780
- # Li, X., * Stainback, A., Barton, C., Yang, J. (2018). Valuing the environmental benefits from reforestation on reclaimed surface mines in Appalachia, *Journal of the American Society of Mining and Reclamation*, 7(1), 1-29. doi: <http://doi.org/10.21000/JASMR18010001>
- + Hackworth, Z. J., Lhotka, J. M., Cox, J. J., Barton, C. D., Springer, M. T. (2018). First-Year Vitality of Reforestation Plantings in Response to Herbivore Exclusion on Reclaimed Appalachian Surface-Mined Land, *Forests*, 9(4), 222.
| JIF: 2.116
- Sena, K. L., Yeager, K. M., Dreaden, T. J., Barton, C. D. (2018). Phytophthora cinnamomi colonized reclaimed surface mined sites in Eastern Kentucky: Implications for the restoration of susceptible species, *Forests*, 9(4). doi: 10.3390/f9040203
- + Blackburn-Lynch, W., Agouridis, C. T., Barton, C. D. (2017). Development of Regional Curves for Hydrologic Landscape Regions (HLR) in the Contiguous United States, *JOURNAL OF THE AMERICAN WATER RESOURCES ASSOCIATION*, 53(4), 903-928. doi: 10.1111/1752-1688.12540
| JIF: 1.717
- Bell, G., Sena, K. L., Barton, C. D., French, M. (2017). Establishing Pine Monocultures and Mixed Pine-Hardwood Stands on Reclaimed Surface Mined Land in Eastern Kentucky: Implications for Forest Resilience in a Changing Climate, *FORESTS*, 8(10). doi: 10.3390/f8100375
| JIF: 1.951
- Sanderson, T. M., Barton, C. D., Cotton, C., Karathanasis, T. (2017). Long-Term Evaluation of Acidic Atmospheric Deposition on Soils and Soil Solution Chemistry in the Daniel Boone National Forest, USA, *WATER AIR AND SOIL POLLUTION*, 228(10). doi:

10.1007/s11270-017-3583-2

| JIF: 1.702

Drayer, A. N., Sena, K. L., Barton, C. D., Andrews, D. M. (2017). Long-Term response of stream and riparian restoration at Wilson Creek, Kentucky USA, *Ecological Restoration*, 35(3), 246-254. doi: 10.3368/er.35.3.246

Adkins, J. K., Barton, C. D., Grubbs, S., Stringer, J. W., Kolka, R. K. (2016). Assessment of Streamside Management Zones for Conserving Benthic Macroinvertebrate Communities Following Timber Harvest in Eastern Kentucky Headwater Catchments, *WATER*, 8(6). doi: 10.3390/w8060261

* Price, S. J., + Muncy, B. L., Bonner, S. J., Drayer, A. N., Barton, C. D. (2016). Effects of mountaintop removal mining and valley filling on the occupancy and abundance of stream salamanders, *JOURNAL OF APPLIED ECOLOGY*, 53(2), 459-468. doi: 10.1111/1365-2664.12585

| JIF: 5.301

Witt, E. L., Barton, C. D., Stringer, J. W., Kolka, R. K., Cherry, M. A. (2016). Influence of Variable Streamside Management Zone Configurations on Water Quality after Forest Harvest, *JOURNAL OF FORESTRY*, 114(1), 41-51. doi: 10.5849/jof.14-099

Journal Article, Public or Trade Journal

French, M., Barton, C. D. (2017). Restoration of the red spruce ecosystem in the Monongahela National Forest Asheville, NC, *Journal of the American Chestnut Foundation*, 31(1), 9-12.

Magazine/Trade Publication

Tyree, M., Larkin, J., Angel, P., Eggerud, S., French, M., Barton, C. D. (2018). Flight 93 National Memorial reforestation project: Native woody plant survival on reclaimed mineland. Winnipeg, Manitoba, *Reclamation Matters*, Fall 2018, 33-35.

Author Role:

I received the grant for the project, helped with installation, subcontracted IUP to do summer field work, helped with analysis and manuscript generation.

Sena, K., Dreaden, T., Crocker, E. V., Barton, C. D. (2018). Reducing the risk of root-rot: Taking steps toward understanding *Phytophthora cinnamomi* distribution in the eastern US. Asheville, NC, *The Journal of the American Chestnut Foundation*, 33(3), 37-39.

Author Role:

Major professor for Sena. Funded the project, helped design experiment, field work and collaborated with writing.

Public Data Release on Science Base

Sena, K., Barton, C. D., Barton, C. (2019). Water quality of precipitation and streamflow, with air temperature data, in four Kentucky, Appalachian watersheds – 1971 to 2018: U.S. Geological Survey data release. Lexington, *USGS Science Base*.

Barton, C. D. (2017). Foreword *Spoil to Soil: Mine Site Rehabilitation and Revegetation*, ix-x. doi: 10.1201/9781351247337

Report, Technical

Adams, M. B., Sanderson, T., Sena, K., Barton, C. D., Angel, P., Zipper, C. (2019). Managing invasive exotic plant species on legacy mine lands. Washington, DC, *USDI Office of Surface Mining Reclamation and Enforcement*(Forestry Reclamation Advisory #16), 18 pp.

Zipper, C., Angel, P., Adams, M. B., + Sanderson, T., Sena, K., Barton, C. D., Barton, C. T. (2019). Using the Forestry Reclamation Approach to control invasive exotic plant species on active mine sites. Washington DC, *USDI Office of Surface Mining Reclamation and Enforcement*(Forestry Reclamation Advisory # 17), 7 pp.

Burger, J., Zipper, C., Skousen, J., Angel, P., Hall, N., * Barton, C. D., Eggerud, S. (2017). Chapter 10: Establishing native trees on legacy surface mines. *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. 10-1 - 10-12.

+ French, M., * Barton, C. D., Zipper, C., Skousen, J., Angel, P., McCarthy, B., Keiffer, C. (2017). Chapter 12: Reestablishing American Chestnut on Mined Lands in the Appalachian Coalfields *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. 12-1 - 12-9.

* Skousen, J., * Zipper, C., * Burger, J., * Barton, C. D., Angel, P. (2017). Chapter 3: Selecting materials for mine soil construction when establishing forests on Appalachian mined lands. *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. 3-1 - 3-10.

Sweigard, R. J., Zipper, C., Burger, J., Skousen, J., * Barton, C. D., Angel, P. (2017). Chapter 4: Low compaction grading to enhance reforestation success on coal surface mines. *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. 4-1 - 4-8.

Stram, B., Zipper, C., Burger, J., Skousen, J., * Barton, C. D., Angel, P. (2017). Chapter 5: Loosening compacted soils on mined lands. *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. 5-1 - 5-6.

Burger, J., Zipper, C., Skousen, J., Angel, P., Davis, V., * Barton, C. D., Franklin, J. (2017). Chapter 6: Tree-compatible ground covers for reforestation and erosion control. *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. 6-1 - 6-8.

Groninger, J., Zipper, C., Burger, J., * Barton, C. D., Skousen, J., Angel, P. (2017). Chapter 8: Mine reclamation practices to enhance forest development through natural succession. *The*

Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service(General Technical Report NRS-169), Pp. 8-1 - 8-7.

* Barton, C. D., * Zipper, C., * Burger, J. (2017). Preface *The Forestry Reclamation Approach: Guide to Successful Reforestation of Mined Lands, U.S. Forest Service*(General Technical Report NRS-169), Pp. i-iii.

Sponsored Projects

Awarded

Crocker M., Agouridis C., T., Barton C., D., DeBolt S., Escobar I., C., Landon J., R., Mark T., B., Moe L., A., Santillan-Jimenez E., NRT: IN FELLOWS & an Academy of Innovators at the Nexus of Food, Energy & Water Systems, Sponsored by National Science Foundation Submitted: February 19, 2019. Funding Dates: September 1, 2019 - August 31, 2024. | Awarded: \$2,998,456.00
OSPA ID: 201902191625

Closed

Barton C., D., Agouridis C., T., Restoring Headwater Streams and Riparian Corridors at the Savannah River Site, SC: Part B- Restoration Proposal and Permit Application, Sponsored by Forest Service Submitted: May 27, 2017. Funding Dates: July 7, 2017 - September 30, 2020. | Awarded: \$16,848.00
OSPA ID: 201705271111

Barton C., D., Water For The Future: Upgrading The Robinson Forest Stream Monitoring Network To Improve Quality And Assessibility, Sponsored by National Science Foundation Submitted: December 11, 2017. Funding Dates: August 1, 2018 - January 31, 2020. | Awarded: \$166,140.00
OSPA ID: 201712111043

Barton C., D., Agouridis C., T., Yeager K., M., Evaluating the Influence of the Forestry Reclamation Approach on Hydrology and Water Quality in Appalachian Coal Minesp, Sponsored by Surface Mining Reclamation and Enforcement Submitted: November 6, 2015. Funding Dates: October 1, 2016 - June 30, 2019. | Awarded: \$195,490.00
OSPA ID: 201511060808

Lhotka J., M., Barton C., D., Stringer J., W., Effect of grading technique on forest productivity of high-value tree species in reforested surface mine lands, Sponsored by Department of the Interior Submitted: March 11, 2015. Funding Dates: June 1, 2015 - December 31, 2017. | Awarded: \$174,765.00
OSPA ID: 201503111129

Barton C., D., Restoring native forests and wildlife habitat on coal mined lands in the Cumberland Plateau, Sponsored by National Fish and Wildlife Foundation Submitted: June 15, 2015. Funding Dates: July 1, 2015 - August 31, 2017. | Awarded: \$149,384.00
OSPA ID: 201506151449

Barton C., D., Karathanasis A., D., Evaluation of acidic atmospheric deposition and its influence on soil solution composition in the Daniel Boone National Forest, Sponsored by Forest Service Submitted: September 23, 2011. Funding Dates: November 22, 2011 - November 22, 2016. | Awarded: \$91,597.00
OSPA ID: 201109231407

Barton C., D., Stringer J., W., Restoring Native Forests and Wildlife Habitat on Mined Land at

Robinson Forest, Kentucky, Sponsored by National Fish and Wildlife Foundation Submitted: November 14, 2013. Funding Dates: March 1, 2014 - September 30, 2016. | Awarded: \$140,000.00
OSPA ID: 201311141333

Warner R., C., Agouridis C., T., Barton C., D., Unrine J., M., Appalachian Research Initiative for Environmental Science (ARIES), Sponsored by Virginia Polytechnic Institute and State University Submitted: August 18, 2011. Funding Dates: July 1, 2011 - June 30, 2016. | Awarded: \$780,883.00
OSPA ID: 201108181017

Not Funded

Barton C., D., Agouridis C., T., McCulley R., L., Appalachian Center For Ecological Restoration: Training A New Generation Of Restoration Practitioners And Evaluators, Sponsored by National Institute of Food and Agriculture Submitted: August 15, 2017. Requested: \$721,375.00, | Awarded: \$0.00
Description: Project involved the establishment of the Appalachian Center for Ecological Restoration (ACER).
OSPA ID: 201708150749

Barton C., D., Stringer J., W., Bolstering the Regenerative Economy in Appalachia Through Forestry Education and Training, Sponsored by Appalachian Regional Commission Submitted: July 31, 2018. | Awarded: \$0.00
OSPA ID: 201807310834

Agouridis C., T., Barton C., D., Colliver D., G., Contreras M., A., Lhotka J., M., Stringer J., W., Center for Sustainable Rural Development (CSR), Sponsored by University of Montana Submitted: February 1, 2016. | Awarded: \$0.00
OSPA ID: 201602011231

Barton C., D., Agouridis C., T., Healthy Food, Healthy Environment and New Opportunities for Coal Mine Impacted Lands and Communities in Eastern Kentucky, Sponsored by Department of the Interior Submitted: July 25, 2016. Requested: \$4,060,229.00, | Awarded: \$0.00
OSPA ID: 201607251031

Crocker M., Agouridis C., T., Barton C., D., DeBolt S., Escobar I., C., Landon J., R., Lynn B., Meier M., Santillan-Jimenez E., NRT-INFEWS: IN FELLOWS & an Academy of Innovators at the Nexus of Food, Energy & Water Systems, Sponsored by National Science Foundation Submitted: February 2, 2017. Requested: \$3,000,000.00, | Awarded: \$0.00
OSPA ID: 201702021136

Crocker M., Agouridis C., T., Barton C., D., DeBolt S., Jensen J., Landon J., R., Mark T., B., Moe L., A., Santillan-Jimenez E., NRT-INFEWS: IN FELLOWS & an Academy of Innovators at the Nexus of Food, Energy & Water Systems, Sponsored by National Science Foundation Submitted: February 5, 2018. Requested: \$3,000,000.00, | Awarded: \$0.00
OSPA ID: 201802051132

Barton C., D., OPUS: Synthesis of Long-Term Monitoring Data to Assess the Influences of Resource Extraction, Climate Variability, and Atmospheric Deposition as Drivers of Environmental Change in Robinson Forest, Eastern Kentucky, Sponsored by National Science Foundation Submitted: July 24, 2020. | Awarded: \$0.00
OSPA ID: 202007241649

Barton C., D., Reclaimed Mines for Chestnut Restoration: Will Phytophthora Cinnamomi Recolonize Reclaimed Mine Sites?, Sponsored by American Chestnut Foundation Submitted: August 6, 2016. | Awarded: \$0.00

OSPA ID: 201608061027

Barton C., D., Use of Long-term Data to Determine Climate and Land-use Influences On Water Quality And Quantity In Central Appalachian Region Of The U.S., Sponsored by US Geological Survey Submitted: June 1, 2018. | Awarded: \$0.00
OSPA ID: 201806011249

Pending

Barton C., D., Beymer-Farris B., Restoration Ecology for Appalachia: Building capacity for undergraduate training in ecological restoration, Sponsored by National Institute of Food and Agriculture Submitted: April 1, 2020. | Awarded: \$0.00
OSPA ID: 202004010950

Scope Grants

Awarded

Barton C., D., Agouridis C., T., Santillan-Jimenez E., Escobar I., C., Landon J., R., Moe L., A., Crocker M., DeBolt S., Mark T., B., Participant Support Scope: NRT: IN FELLOWS & an Academy of Innovators at the Nexus of Food, Energy & Water Systems, Sponsored by National Science Foundation Submitted: September 3, 2019. Funding Dates: September 1, 2019 - August 31, 2024. | Current Budget Amount: \$1,416,342.00
Prime Grant OSPA ID: 201902191625

Non-Sponsored Projects

Federal

Not Funded

Barton, C. D., Abbott, A. G., Agouridis, C. T., Jacobsen, K. L., Lhotka, J. M., OCHUODHO, T. (Co-Investigator), Integrated Agroenergy Production Systems for Economic and Ecological Transition on Rural Marginal Land, National Science Foundation, (January 1, 2018 - December 30, 2022). Awarded: \$2498772.
Description: Innovations at the Nexus of Food, Energy and Water Systems (INFEWS).

Barton, C. D., Crocker, E., Dreaden, T., Sena, K., Yang, J., Tracking a Tree-killer: Characterizing current and predicting future distribution of *Phytophthora cinnamomi* in Appalachia, NSF. Description: Pre-proposal was submitted to the Division of Environmental Biology of NSF. Full proposal was not invited.

McIntire-Stennis

Closed

Barton, C. D., Water Resources in a Changing World: How Changes in Climate and Land-Use Influence Water Quality and Quantity in the Cumberland Plateau Region of Kentucky, (January 12, 2015 - September 30, 2019).

On-going

Barton, C. D., Use of Long-Term Data to Determine Climate and Land-Use Influences on Water Quality and Quantity in the Central Appalachian Region of the U.S., (October 1, 2019 - September 30, 2024).

Barton, C. D., Water Resources in a Changing World: How Changes in Climate and Land-Use Influence Water Quality and Quantity in the Cumberland Plateau Region of Kentucky, National Institute of Food and Agriculture, (January 12, 2015 - September 30, 2019).

University

Not Funded

Norman-Burgdolf, H. (Co-Investigator), Campbell, M. (Co-Investigator), Agouridis, C. T. (Co-Investigator), Barton, C. D. (Principal), Sena, K. (Co-Investigator), "Hemlock Hustle": Facilitating Human and Environmental Health Education at Robinson Forest, University of Kentucky Sustainability Challenge Grant, (January 2018 - December 2018). Awarded: \$40268.

Cox, J. J., Barton, C. D., Lhotka, J. M., Springer, M. T., Hackworth, Z. (Grad/Prof Student), Utilizing Herbivore Exclusion Techniques to Improve the Success of Surface Mine Restoration Efforts, University of Kentucky Sustainability Grant. Awarded: \$17000.

On-going

Agouridis, C. T. (Principal), Crocker, E. V. (Co-Principal), Barton, C. D. (Co-Principal), Gumbert, A. C. A. (Co-Principal), Springer, M. T. (Co-Principal), Sanderson, W. T. (Co-Principal), Thomas, L. (Co-Principal), Stamper, D. J. (Co-Principal), Belton, C. (Co-Principal), Long, P. (Co-Principal), Kentucky Master Naturalist: Promoting Environmental Stewardship through Student and Volunteer Training. Sustainability Challenge Grant, University of Kentucky., President's Sustainability Advisory Committee, Tracy Farmer Institute for Sustainability and the Environment, and Office of Sustainability, (January 2018 - December 2018). Awarded: \$14257.

Description: Funding to initiate a master naturalist program within Kentucky involving both University of Kentucky students as well as county extension offices.

Presentations Given

Price S. J., Bonner S. J., Hutton J. M., Drayer A. N., Muncy B. L., Freytag S. B., Barton C. D., (October 2018). Mountaintop mining and stream salamanders: searching for mechanisms responsible for population declines. The Wildlife Society Annual Meeting, The Wildlife Society, Cleveland, OH. Accepted, National.

Barton C. D., Teagan D., (April 2016). Long-term Evaluation of Reforestation Success on an Appalachian Surface Coal Mine National Council on Undergraduate Research Conference, National Council on Undergraduate Research. Accepted.

Invited Speaker

Barton C. D., (September 9, 2020). Bringing Back the Forest: Ecological Restoration on the Monongahela National Forest Fall Meeting of the Virginia Native Plant Society, Virginia Native Plant Society, Virtual, VA, United States. Invited, State.

Barton C. D., (October 24, 2019). Bringing Back the Forest: Reforestation of Coal Mines Provides New Opportunities Central Queensland Mining Rehabilitation Group Quarterly Meeting, Central Queensland Mining Rehabilitation Group, Dysart, Australia. Invited, International.

Barton C. D., (April 11, 2018). Bringing Back the Forest: University Research, Outreach, Community Engagement, and Partnerships for the Reforestation of Coal Mines in Appalachia. Centre College Convocation, Centre College, Danville, KY, United States. Invited, Regional.

Barton C. D., (April 2017). Restoring red spruce ecosystems on the Monongahela National Forest. American Society of Mining and Reclamation Annual Meeting, American Society of Mining and Reclamation. Invited, National.

Other

Barton C. D., Sena K., Crocker E., Dreaden T., Clark C., (October 2017). Tracking a Tree-killer: Detecting *Phytophthora cinnamomi* in Appalachian forests. Soil Science Society of America Annual Meeting, Soil Science Society of America, FL. Accepted, National.

Podium Session

Sena K., Williamson T., Barton C. D., (November 16, 2020). Forty Years of Data: Challenges and opportunities afforded by long-term data sets. Interagency Conference on Research in the Watersheds (ICRW), USDA Forest Service and the USDA NRCS, Virtual, SC, United States. Accepted, National.

Lambert M., Barton C. D., Price S. J., (November 4, 2020). Evaluation Artificial Wetland Effectiveness Using Amphibians as Indicators of Habitat Quality on a Reforested Surface Mine in the Monongahela National Forest, West Virginia Central Appalachian Spruce Restoration Initiative 2020 Conference, The Nature Conservancy, Virtual, WV, United States. Invited, Regional.

Branduzzi A., Barton C. D., Baskin C., (November 4, 2020). Methods for Increasing Native Plant Diversity on Minelands in the Red Spruce Ecosystem Central Appalachian Spruce Restoration Initiative 2020 Conference, The Nature Conservancy, Virtual, WV, United States. Invited, Regional.

Williamson T., Sena K., Barton C. D., (October 26, 2020). Water resources in a changing world: Long-term hydrologic monitoring provides insight into changes in precipitation and stream-water quality at Robinson Forest in eastern Kentucky, Appalachia, USA Scientific Symposium of the National Atmospheric Deposition Program, NADP and USGS, Virtual, United States. Accepted, National.

Sena K., Barton C. D., (October 20, 2020). Creative solutions to complex ecological challenges: Lessons from an experimental loblolly pine plantation in Kentucky Annual Meeting of the National Association of State Land Reclamationists, National Association of State Land Reclamationists, Virtual. Accepted, National.

- Sena K., French M., Barton C. D., (September 9, 2019). Revisiting Carbon Sequestration Potential on Appalachian Legacy Mines: Review and Synthesis Joint meeting of the National Association of Abandoned Mined Land Programs (NAAML), the National Association of State Land Reclamationists (NASLR) and Pennsylvania's Annual Conference on Abandoned Mine Reclamation (PA AMR), NAAML, NASLR and PA AMR, Pittsburgh, PA, United States. Accepted, Regional.
- Hall S., Barton C. D., Angel P., Sena K., (August 11, 2019). Reforesting Appalachian surface mines from seed: A black walnut pilot study Ecological Society of America annual meeting, Ecological Society of America, Louisville, KY, United States. Accepted, International.
- Sena K., Yeager K. M., Lhotka J. M., Barton C. D., (July 25, 2019). Development of Mine Soils in a Chronosequence of FRA-reclaimed sites in Eastern Kentucky Appalachian Regional Reforestation Initiative (ARRI), ARRI, Cambridge, OH, United States. Accepted, Regional.
- Gerlitz M., Agouridis C. T., Barton C. D., (July 25, 2019). Evaluating the influence of the forestry reclamation approach on the hydrology of Appalachian coal mined lands Appalachian Regional Reforestation Initiative (ARRI) Annual Meeting, ARRI, Cambridge, OH, United States. Accepted, Regional.
- Drayer A., Lambert M., Barton C. D., Price S. J., (July 25, 2019). Evaluation Artificial Wetland Effectiveness Using Amphibians as Indicators of Habitat Quality on a Reforested Surface Mine in the Monongahela National Forest, West Virginia Appalachian Regional Reforestation Initiative (ARRI) Annual Meeting, ARRI, Cambridge, OH, United States. Regional.
- Hackworth Z. J., Lhotka J. M., Cox J. J., Barton C. D., Springer M. T., (2018). First-year vitality of reforestation plantings in response to herbivore exclusion on reclaimed Appalachian surface-mined land. Annual Meeting of the Kentucky Chapter of The Wildlife Society, KY TWS, Cadiz, KY, United States. Accepted, State.
- Sena K., Frederick J., Agouridis C. T., Barton C. D., (August 8, 2018). Spoil type influences soil development and tree growth after ten years Appalachian Regional Reforestation Initiative Annual Meeting, Appalachian Regional Reforestation Initiative, Indiana, PA, United States. Accepted, Regional.
- Hutton J. M., Price S. J., Bonner S. J., Richter S. C., Barton C. D., (May 2018). Plethodontid stream salamander occupancy, abundance and diet along a conductivity gradient. Society of Freshwater Science Annual Meeting, Society of Freshwater Science, Detroit, MI. Accepted, Regional.
- Hutton J. M., Price S. J., Bonner S. J., Richter S. C., Barton C. D., (February 2018). Population and allochthony threshold responses of Plethodontid stream salamanders to Conductivity. Southeast Partners in Amphibian and Reptile Conservation Annual Meeting, Southeast Partners in Amphibian and Reptile Conservation, Helen, GA. Accepted, Regional.
- Dement W., Lhotka J. M., Barton C. D., Stringer J. W., (September 24, 2017). An investigation of tree growth and colonization on a 19 year-old forestry reclamation site National Association of Abandoned Mine Land Programs Conference, Lexington, KY. Accepted, National.

Dement W., Lhotka J. M., Barton C. D., Stringer J. W., (April 9, 2017). An investigation of tree growth and colonization on a 19 year-old forestry reclamation site Joint Conference of the American Society of Mining and Reclamation and Appalachian Regional Reforestation Initiative, American Society of Mining and Reclamation and Appalachian Regional Reforestation Initiative, Morgantown, WV, United States. Accepted, National.

Poster Session

Lambert M., Price S. J., Barton C. D., (August 14, 2019). Evaluation of artificial wetland effectiveness using amphibians as indicators of habitat quality on a reforested surface mine in the Monongahela National Forest, West Virginia ESA/USSEE Joint Meeting.

Sena K., Yeager K. M., Dreaden T., Barton C. D., (August 8, 2018). Phytophthora cinnamomi colonized reclaimed mined sites in eastern Kentucky Appalachian Regional Reforestation Initiative annual meeting, Appalachian Regional Reforestation Initiative, Indiana, PA, United States. Regional.

Gerlitz M., Agouridis C. T., Barton C. D., (December 6, 2017). Hydrologic Study of Mine Reclamation Sites in Eastern Kentucky Coalfields 7th Annual Sustainability Forum, Tracy Farmer Institute for Sustainability and the Environment; Appalachian Center, Lexington, KY, United States. University.

Dement W., Lhotka J. M., Barton C. D., Stringer J. W., (March 13, 2017). Effect of grading on productivity of high-value tree species in Appalachian surface mines. 19th Biennial Southern Silviculture Research Conference, Blacksburg, VA, United States. Accepted, National.

Price S. J., Muncy B., Bonner S. J., Drayer A., Barton C. D., (March 30, 2016). Effects of mountaintop removal mining and valley fills on occupancy and abundance of stream salamanders. Association of Southeastern Biologists Annual Meeting, Association of Southeastern Biologists, Concord, NC, United States. Accepted, Regional.

Freytag S., Price S. J., Bonner S. J., Muncy B., Drayer A., Barton C. D., (March 30, 2016). Occupancy dynamics of stream salamanders in degraded and reference headwater streams. Association of Southeastern Biologists Annual Meeting, Association of Southeastern Biologists, Concord, NC, United States. Accepted, Regional.

Freytag S., Price S. J., Bonner S. J., Muncy B., Drayer A., Barton C. D., (February 19, 2016). Occupancy dynamics of stream salamanders in degraded and reference headwater streams. Southeast Partners in Amphibian and Reptile Conservation Annual Meeting, Southeast Partners in Amphibian and Reptile Conservation, Nauvoo, AL, United States. Accepted, Regional.

Specialty Presentation

Barton C. D., (May 2017). Forest restoration at the Flight 93 National Memorial Earth Day Celebration, Flight 93 National Memorial, Shanksville, PA. Invited, National.

Extension

Extension Publications & Media

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

Published

Peer-Reviewed

Extension Publication- Numbered, Original Content

Zipper, C., Agouridis, C. T., Krenz, R., Sweeten, E., Barton, C. D., Angel, P. (2018). Establishing Riparian Woody Vegetation for Constructed Streams on Mined Lands Using the Forestry Reclamation Approach *Forestry Reclamation Advisory, US Department of Interior, Office of Surface Mining, Reclamation and Enforcement*, 15, 6.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
FOR 460 - 001	3.00000 - 3.00000	26	10 Fall 2020-2021
FOR 770 - 003	1.00000 - 1.00000	3	10 Fall 2020-2021
NRE 320 - 010	3.00000 - 3.00000	4	50 Summer 2019-2020
FOR 356 - 001	1.00000 - 1.00000	12	30 Spring 2019-2020
FOR 748 - 002	0.00000 - 0.00000	1	30 Spring 2019-2020
FOR 460 - 001	3.00000 - 3.00000	34	10 Fall 2019-2020
NRE 320 - 010	3.00000 - 3.00000	12	50 Summer 2018-2019
FOR 356 - 001	1.00000 - 1.00000	14	30 Spring 2018-2019
FOR 460 - 001	3.00000 - 3.00000	30	10 Fall 2018-2019
FOR 599 - 010	1.00000 - 3.00000	1	10 Fall 2018-2019
NRE 320 - 010	3.00000 - 3.00000	13	50 Summer 2017-2018
FOR 356 - 001	1.00000 - 1.00000	17	30 Spring 2017-2018
FOR 748 - 002	0.00000 - 0.00000	1	30 Spring 2017-2018
PLS 767 - 034	2.00000 - 2.00000	1	30 Spring 2017-2018
FOR 460 - 001	3.00000 - 3.00000	33	10 Fall 2017-2018
FOR 768 - 003	1.00000 - 6.00000	1	10 Fall 2017-2018
PLS 767 - 024	2.00000 - 2.00000	1	10 Fall 2017-2018
NRE 320 - 010	3.00000 - 3.00000	17	51 1st summer 2016-2017
APP 395 - 002	1.00000 - 6.00000	1	30 Spring 2016-2017
FOR 356 - 001	1.00000 - 1.00000	12	30 Spring 2016-2017

FOR 781 - 002	1.00000 - 3.00000	1	30 Spring 2016-2017
PLS 767 - 034	2.00000 - 2.00000	1	30 Spring 2016-2017
FOR 460 - 001	3.00000 - 3.00000	31	10 Fall 2016-2017
NRE 320 - 010	3.00000 - 3.00000	16	51 1st summer 2015-2016
FOR 356 - 001	5.00000 - 5.00000	8	30 Spring 2015-2016
PLS 767 - 034	2.00000 - 2.00000	1	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
FOR 356 - 001	11	3.09	2.17	30 Spring 2017-2018
FOR 460 - 001	5	3.40	4.00	10 Fall 2020-2021
FOR 460 - 001	15	4.64	4.73	10 Fall 2019-2020
FOR 460 - 001	9	4.67	4.78	10 Fall 2018-2019
FOR 460 - 001	16	3.75	3.69	10 Fall 2017-2018
FOR 460 - 001	19	2.53	4.11	10 Fall 2016-2017
NRE 320 - 010	5	4.00	4.60	50 Summer 2018-2019
NRE 320 - 010	5	3.60	4.60	51 1st summer 2016-2017
NRE 320 - 010	7	3.00	3.29	51 1st summer 2015-2016

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Dissertation Committee Chair

Kenton Sena, Integrated Plant and Soil Science, "Tracking a Tree-killer: Improving detection and characterizing species distribution of *Phytophthora cinnamomi* in Appalachian forests.," Status: Completed. (July 2018).

Richard Biemiller, Entomology, "Influence of structural disturbance on stream function and macroinvertebrate communities in Upper Coastal Plain headwater streams.." (December 2016).

Dissertation Committee Member

Kathryn Greene, Biology, Status: In-Process, Expected Completion Date: May 2022. (July 2018 - Present).

Zhijie Yang, Integrated Plant and Soil Science, Status: Completed, Expected Completion Date: September 2020. (July 2016 - September 2020).

Ashley Bandy, Earth and Environmental Sciences, Status: Degree Awarded. (2017).

Whitney Blackburn-Lynch, Biosystems and Agricultural Engineering, Status: Degree Awarded. (2016).

Master's Thesis Committee Chair

Benjamin Rhodes, Forestry, Status: In-Process, Expected Completion Date: May 2022. (July 2020 - Present).

Briana Snyder, Forestry, Status: In-Process, Expected Completion Date: May 2022. (July 2020 - Present).

Kyle Howard, Forestry and Natural Resources, "Influence of acid deposition on forest soils in the Daniel Boone National Forest," Status: In-Process, Expected Completion Date: December 2018. (January 2016 - Present).

Anna Branduzzi, Forestry and Natural Resources, "Enhancing native plant diversity on legacy minelands," Status: Degree Awarded, Expected Completion Date: December 2020. (August 2018 - December 2020).

Michael French, Forest and Natural Resource Sciences, "Establishment of American chestnuts on surface mined lands in the Appalachian Coalfields Region.." (December 2017).

Master's Thesis Committee Co-Chair

Michaela Lambert, Forest and Natural Resource Sciences, "Amphibian use of created wetlands on the Monongahela National Forest," Status: Degree Awarded, Steve Price. (July 2017 - May 2020).

Joseph Frederick, Forest and Natural Resource Sciences, "Long-term evaluation of forest plantations on surface mines in eastern Kentucky," Status: Degree Awarded, John Lhotka. (January 2017 - December 2019).

Douglass Potter, Forest and Natural Resource Sciences, Status: Degree Awarded. (2016 - December 2019).

Master's Thesis Committee Member

Kai Davis, Forestry and Natural Resources, Status: In-Process. (July 2020 - Present).

Katherine Love, Forestry, Status: Degree Awarded. (July 2018 - May 2020).

Morgan Gerlitz, Biosystems and Agricultural Engineering, "Influence of the Forestry Reclamation Approach on Water Budgets," Status: Degree Awarded, Expected Completion Date: December 2018. (August 2016 - December 2019).

William Bond, Earth and Environmental Sciences, "Influence of the Forestry Reclamation Approach on Stream Sedimentation," Status: Degree Awarded, Expected Completion Date: December 2018. (August 2016 - May 2019).

Catherine Skees, Earth and Environmental Sciences, Status: Degree Awarded. (2018).

Jacob Hutton, Forest and Natural Resource Sciences, Status: Degree Awarded. (2018).

Joshua Felch, Forest and Natural Resource Sciences, Status: Degree Awarded. (2018).

Zachary Hackworth, Forest and Natural Resource Sciences, Status: Degree Awarded. (2018).

Devin Black, Forest and Natural Resource Sciences, Status: Degree Awarded. (2017).

Jeremy Eddy, Earth and Environmental Sciences, Status: Degree Awarded. (2017).

Wesley Dement, Forest and Natural Resource Sciences, Status: Degree Awarded. (2017).

Christian Oldham, Forest and Natural Resource Sciences, Status: Degree Awarded. (2016).

Kameryn White, Biosystems and Agricultural Engineering, Status: Degree Awarded. (2016).

Sara Beth Freytag, Forest and Natural Resource Sciences, Status: Degree Awarded. (2016).

Service

Department Service

Committee Member

Robinson Forest Committee, (January 2003 - Present).

UK Department of Forestry and Natural Resources, Graduate Program Committee, (July 1, 2019 - June 30, 2021).

College Service

Committee Member

Steering Committee Member, UK Natural Resource Conservation and Environmental Sciences Program, (July 2018 - Present).

TFISE - Water Working Group, (2013 - Present).

Committee on Research and Policy, (2008 - Present).

CAFÉ Promotion and Tenure Review Committee, (July 2019 - June 2021).

Steering Committee Member, UK Integrated Plant and Soil Science Program, (January 2018 - June 2020).

University Service

UK Graduate Council Committee on Fellowships and Traineeships, (July 2018 - Present).

Committee Member

UK Appalachian Center Academic Committee, (July 2018 - Present).

University of Kentucky Representative, Consortium of Universities for the Advancement of Hydrological Sciences, (2003 - Present).

Professional Service

Committee Chair

Appalachian Regional Reforestation Initiative, Science Team, (2007 - Present).

Appalachia Regional Reforestation Initiative 2020 Annual Conference, Co-Organizer of the Conference Committee, (July 2019 - June 2020).

Committee Member

Appalachian Studies Association Annual Conference, 2020 Annual Conference Organization Committee, (July 2017 - April 2020).

Editor, Associate Editor

International Journal of Mining, (2007 - Present).

International Journal of Phytoremediation, (2005 - Present).

Founder & President

Green Forests Work, The Surface Mining Control and Reclamation Act (SMCRA) of 1977 created the U. S. Office of Surface Mining Reclamation and Enforcement (OSMRE), whose mission was to enforce a new set of reclamation guidelines that would standardize reclamation practices for the mining industry. Prior to SMCRA, some mining operations practiced “shoot ‘n shove” mining, where overburden was “shot” off the coal seam and “shoved” downhill. Revegetation requirements were minimal and varied from state to state, as there was no national standard. The loose piles of overburden could support tree growth, but they were also highly unstable. As a result, large landslides occurred and created a hazard to public safety. SMCRA addressed this issue by requiring more intense grading. The overburden was used to backfill the mined area to achieve the approximate original contour, but the grading led to severe soil compaction. Native hardwood trees could not tolerate the compaction and competition from aggressive groundcovers, so mining operations moved away from forestry reclamation (i.e. planting trees) to establishing hayland/pasture to meet revegetation

requirements. Without management, the pastures were quickly (within 10 years) overcome with invasive, exotic species and resided in a state of arrested succession. Researchers foresaw the unintended consequences of SMCRA and began developing a method of reclamation in the 1980s that would allow both stability and tree growth. By 2004, there were numerous scientific studies supporting what became known as the Forestry Reclamation Approach (FRA).

The OSMRE created the Appalachian Regional Reforestation Initiative (ARRI) in 2004 to coordinate the implementation of the FRA. After making progress with the active mining industry, ARRI members began to look back at the sites reclaimed under SMCRA that led to their establishment, so called "legacy" mines. Experimental re-reclamation of legacy mines by ARRI members revealed the need for increased scale to stimulate the economic development and environmental improvement Appalachia needed, thus the idea of Green Forests Work was born. Further research laid the groundwork for the modified version of the FRA that we use today., (2013 - Present).

Reviewer, Grant Proposal

National Science Foundation, Panel Member, (November 2020).

Reviewer, Journal Article

Various Journals, Reviewed over 20 manuscripts in 2019 and 2020, (2019 - 2020).

Public Service

Committee Member

Diocese of Lexington, Laudato Si Committee, (April 2017 - Present).

Program Organizer

Osher Lifelong Learning Institute, "Appalachian Natural History and Conservation" workshop, (February 1, 2016).

Workshop Organizer

Angels of Apiculture: Setting the Stage for Healthy Bees, Trees, and Families, Performed pollinator workshops, displays and presentations for Kentucky youth., (October 2016 - December 2017).

Media Contributions

Internet

"Voice of America." (November 13, 2018). Story about red spruce restoration on the Monongahela National Forest., United States.

"Yale Environment 360." (December 2017). Article contributor. New Haven, CT, United States.

"Cool Green Science." (August 15, 2017). Farm Bill Provides Hope for the Cerulean Warbler. Arlington, VA, United States.

"The Appalachian Voice." (June 15, 2017). Restoring Land for Native Plants, Bees and Streams. Boone, NC, United States.

Magazine

"Scientific American." (July 11, 2018). From Defiled to Wild – Can a Spent Coal Mine be Reborn as a Nature Conservation Center?, NY, United States.

Newspaper

"Folha De S.Paulo (Brazil's Largest Newspaper). Dependência de carvão no Kentucky reflete percepção distorcida sobre aquecimento global.

." (October 27, 2020). Status of water resources in Kentucky and how climate change and Presidential candidate could influence future status., Brazil.

"Charleston Gazette-Mail.

." (September 19, 2020). Story about new project to reforest a former coal mine. Charleston, WV, United States.

"The Washington Post Magazine." (February 13, 2020). Story about reforestation efforts in Appalachia. Highlighted the creation of Green Forests Work and the Appalachian Regional Reforestation Initiative.

(UK publicity value of \$451,680.15). DC, United States.

"Associate Press." (November 1, 2019). Story on restoring forest to mitigate climate change.

(picked up by Washington Post, NY Times and several dozen other outlets). United States.

"Lexington Herald-Leader." (April 10, 2018). Kentucky writers, artists are planting trees. This is why. Lexington, KY, United States.

Professional Development

Awards and Honors

Fulbright Distinguished Chair in Science, Technology and Innovation., Fulbright Scholar Program.
Scholarship/Research/Creative, Competitive fellowship, International. (October 1, 2020 - July 31, 2021).

American Society of Mining and Reclamation's William T. Plass Award.
Scholarship/Research/Creative, Lifetime achievement award, International. (June 1, 2020).

Awards:

Kentucky Department of Environmental Protection's Environmental Excellence Award for Resource Caretaker; 2018... Service, Community, Recognition Award, Regional. (September 4, 2018).

Dr. Steven Buck

College of Agriculture, Food and Environment
Department of Agricultural Economics
2016-2021 CV for Annual Performance Review

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites
SNIP = Source Normalized Impact per Paper SJR = Scimago Journal Rank

Published

Journal Article, Academic Journal

- * Buck, S., Kusunose, Y., Alwang, J. (2020). Re-visiting traditional trust measurement: Using artefactual field experiments to measure trust and predict micro-lending decisions, *Agricultural Finance Review*, (ahead of print), 19. doi: 10.1108/AFR-09-2019-0104

Scopus Metric Year: 2019 | Category: Economics, Econometrics and Finance | CiteScore: 2.3
| Highest Percentile: 77 | Rank: #/N: 33/144 | SNIP: 1.375 | SJR: 0.568

Author Role:

S. Buck contributed to *Conceptualization, Methodology design, Formal analysis, Investigation (including experiment execution and data collection), Writing - original draft preparation, and Writing - review and editing.*

- + Uz, D., * Buck, S. (2020). Comparing water use forecasting model selection criteria: The case of commercial, institutional, and industrial sector in southern California, *Sustainability*, 12(10), 21. doi: 10.3390/SU12103995

WOS Metric Year: 2019 | Category: Environmental Studies | JIF: 2.576 | Rank by JIF: 53/123
| TC: 35095 | Rank by TC: 2/123

Scopus Metric Year: 2020 | Category: Social Sciences: Geography, Planning and Development | CiteScore: 3.2 | Highest Percentile: 80 | Rank: #/N: 132/679 | SNIP: 1.165 | SJR: 0.581

Author Role:

D. Uz was a doctoral student when the original analysis and initial draft of the manuscript was completed.

S. Buck contributed to *Idea Conceptualization, Methodology Design, Data Collection, Writing-original draft preparation, Writing-review and editing, and Supervision of Analysis.*

- + Kim, G., + Nemati, M., Buck, S., # Pates, N. J., Mark, T. B. (2020). Recovering Forecast Distributions of Crop Composition: Method and Application to Kentucky Agriculture, *Sustainability*, 12(7), 17. doi: <https://doi.org/10.3390/su12072917>

WOS Metric Year: 2019 | Category: ENVIRONMENTAL SCIENCES -- SCIE | JIF: 2.576 | Rank by

JIF: 120/265 | TC: 18441

Scopus Metric Year: 2019 | Category: Geography, Planning and Development | CiteScore: 3.2 | Highest Percentile: 80 | Rank: #/N: 132/679 | SNIP: 1.165 | SJR: 0.581

Author Role:

S. Kim contributed to *Formal Analysis, Data Collection, Writing-original draft preparation, and Writing-review and editing.*

M. Nemati contributed to *Formal Analysis and Writing-review and editing.*

S. Buck contributed to *Idea Conceptualization, Methodology Design, Writing-original draft preparation, Writing-review and editing, Supervision of Analysis, and Project Administration.*

N. Pates contributed to *Writing-review and editing, and Supervision of Analysis.*

T. Mark contributed to *Idea Conceptualization, Writing-original draft preparation, Writing-review and editing, Project Administration, and Funding Acquisition.*

- * Buck, S., Auffhammer, M., + Soldati, H., Sunding, D. (2020). Forecasting Residential Water Consumption in California: Rethinking Model Selection, *Water Resources Research*, 56(1), 25. doi: 10.1029/2018WR023965

WOS Metric Year: 2019 | Category: Water Resources | JIF: 4.309 | Rank by JIF: 9/94 | TC: 56293 | Rank by TC: 8/380

Scopus Metric Year: 2019 | Category: Water Science and Technology | CiteScore: 6.8 | Highest Percentile: 95 | Rank: #/N: 11/217 | SNIP: 1.544 | SJR: 1.799

Author Role:

S. Buck contributed to *Idea Conceptualization, Methodology Design, Formal Analysis, Data Collection, Writing-original draft preparation, Writing-review and editing, and Supervision of Analysis.*

- * Brown, R. M., Zuo, N., Shockley, J. M., Buck, S. (2019). An Authentic Learning Approach to Group Assignments: An Analysis of Student Attitudes, *Applied Economics Teaching Resources*, Vol 1(Issue 2), 1-13. doi: 10.22004/ag.econ.300069

Alternative Journal Quality Indication: This journal is the newest, peer-reviewed academic journal under the umbrella of the Agricultural & Applied Economics Association (AAEA), our discipline's primary association. Applied Economics Teaching Resources is the primary publication for teaching within the agricultural economics profession.

Author Role:

S. Buck contributed to *Methodology Design and Writing-review and editing.*

- * Brown, R. M., Zuo, N., Shockley, J. M., Buck, S. (2019). The Project Manager/Private Contractor Approach to Group Assignments, *Applied Economics Teaching Resources*, Volume 1(Issue 2), 64-73. doi: 10.22004/ag.econ.300073

Alternative Journal Quality Indication: This journal is the newest, peer-reviewed academic journal under the umbrella of the Agricultural & Applied Economics Association (AAEA), our discipline's primary association. Applied Economics Teaching Resources is the primary publication for teaching within the agricultural economics profession.

Author Role:

S. Buck contributed to *Writing-review and editing*.

+ Zuo, N., Schieffer, J. K., Buck, S. (2019). The Effect of the Oil and Gas Boom on Schooling Decisions in the U.S., *Resource and Energy Economics*, 55, 1-23.
WOS Metric Year: 2019 | Category: Economics | JIF: 1.829 | Rank by JIF: 121/373 | TC: 2179
| Rank by TC: 112/373
Scopus Metric Year: 2019 | Category: Economics, Econometrics, and Finance: Economics and Econometrics | CiteScore: 3.9 | Highest Percentile: 83 | Rank: #/N: 104/637 | SNIP: 1.118 | SJR: 1.488
Author Role:
S. Buck contributed to *Methodology Design, Formal Analysis, Writing-original draft preparation, Writing-review and editing, and Supervision of Analysis*.

* Buck, S. C., Auffhammer, M., Hamilton, S., Sunding, D. (2016). Measuring Welfare Losses from Urban Water Supply Disruptions Chicago, IL, *Journal of the Association of Environmental and Resource Economists*, 42(6), 685-699.

Sponsored Projects

Not Funded

Zheng Y., Buck S., Consumer Preferences for E-Cigarette Attributes: Big Data Analytics Using Homescan Data with Policy Simulations, Sponsored by National Institute of Health
Submitted: February 10, 2017. Requested: \$150,000.00, | Awarded: \$0.00
OSPA ID: 201702101605

Zheng Y., Buck S., E-cigarette Regulatory Analysis: New Evidence from Longitudinal Homescan Data, Sponsored by National Institute of Health Submitted: July 13, 2018. | Awarded: \$0.00
OSPA ID: 201807131856

Davis A., F., Buck S., Mark T., B., Zheng Y., Enhancing The Resilience Of Rural Communities With Transitioning Economics, Sponsored by National Institute of Food and Agriculture
Submitted: November 1, 2017. Requested: \$397,544.00, | Awarded: \$0.00
OSPA ID: 201711010824

Davis A., F., Buck S., Dillon C., R., Freshwater D., Hu W., Kusunose Y., Mark T., B., Reed M., R., Rignall K., E., Shockley J., M., Snell W., M., Tyler Q., R., Woods T., A., Zheng Y., Enhancing the Resiliency of Rural Communities with Transitioning Economies, Sponsored by National Institute of Food and Agriculture Submitted: October 12, 2016. Requested: \$241,000.00, | Awarded: \$0.00
OSPA ID: 201610121028

Zheng Y., Buck S., Quantifying Grocery Tax Impacts on Food Consumption, Food Insecurity, and Health Utilizing State-Level Natural Experiments, Sponsored by Robert Wood Johnson Foundation Submitted: August 30, 2018. | Awarded: \$0.00
OSPA ID: 201808301533

Buck S., The Consequences of Changing Water Availability in California Agriculture for Agricultural Land-Use in the United States, Sponsored by National Institute of Food and Agriculture Submitted: August 5, 2016. Requested: \$459,375.00, | Awarded: \$0.00
OSPA ID: 201608051117

Non-Sponsored Projects

Federal

Hatch Multi-State Closed

Buck, S., Management and Policy Challenges in a Water-Scarce World, (August 7, 2018 - September 30, 2019).

On-going

Buck, S., Management and Policy Challenges in a Water-Scarce World, (March 2, 2020 - September 30, 2024).

Presentations Given

Buck S., Nemati M., (July 2017). The Effect of Social and Consumption Analytics on Residential Water Demand Western Agricultural Economics Association Annual Meeting, CA.

Buck S., Zuo N., Schieffer J., (June 2017). The Effects of the Recent Oil and Gas Boom on Schooling Decisions in the U.S. Association of Environmental and Resource Economists 6th Annual Meeting, PA.

Buck S., Nemati M., (February 2017). Valuing Water Supply Reliability Southern Agricultural Economics Association Annual Meeting, AL.

Buck S., Nemati M., (January 2017). The Effect of Social and Consumption Analytics on Residential Water Demand Allied Social Sciences Associations Annual Meeting, Association of Environmental and Resource Economists, IL.

Buck S., Nemati M., Sunding D., (August 2016). The Welfare Consequences of the 2015 Drought Mandate: Evidence from New Results on Monthly Water Demand Agricultural and Applied Economics Association Annual Meeting, MA.

Buck S., Auffhammer M., (June 2016). Weather and Water Consumption: Evidence from California to Guide Residential Water and Energy Consumption Association of Environmental and Resource Economists 5th Annual Summer Conference, CO.

Invited Speaker

Buck S., (June 10, 2019). Forecasting Urban Water Demands: Rethinking Model Selection Water Futures Conference, Ministry for Foreign Affairs and International Cooperation (Italy), Ministry for Science, Technology and Space (Israel), University of California--Berkeley (USA), and the University of Padova (Italy)., Padova, Italy. Invited, International.

Buck S., (November 16, 2018). High-Frequency Consumption Analytics and Residential Water Consumption: Estimating Heterogeneous Effects Department of Economics Seminar--University of

Nevada, Reno, Department of Economics, University of Nevada, Reno, Reno, NV, United States.
Invited, National.

Mark T. B., Kim G., Buck S., Nemati M., (September 11, 2017). Farm-Level Economics of Hemp 24th Annual Conference, Hemp Industries Association, Lexington, KY, United States. Invited, International.

Mark T. B., Kim G., Buck S., Nemati M., (February 17, 2017). Hemp...What Role Might This Crop Play in Kentucky? Conn Center Seminar, University of Louisville Conn Center, Louisville, KY, United States. Invited, State.

Podium Session

Kim G., Mark T. B., Buck S., Nemati M., (February 2017). Incorporating New Crops into Traditional Crop Rotations and the Environmental Implications Southern Agricultural Economics Association Annual Meeting, SAEA, Mobile, AL, United States. Accepted, Regional.

Specialty Presentation

Buck S., (October 15, 2020). State Report for Kentucky: Water Management and Infrastructure Needs in Kentucky Hatch Multi-State Annual Meeting (Virtual): W-4190 Water Policy and Management Challenges in a Water-Scarce World, National Institute of Food and Agriculture, U.S. Department of Agriculture, ID, United States. Invited, National.

Buck S., (October 4, 2019). State Report for Kentucky: Forecasting Water Consumption and Land-Use Hatch Multi-State Annual Meeting: W-4190 Water Policy and Management in a Water-Scarce World, National Institute of Food and Agriculture, U.S. Department of Agriculture, Minneapolis, MN, United States. National.

Extension

Extension Publications & Media

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

Published

Non Peer-Reviewed

Magazine/Trade Publication

+ Nematia, M., Buck, S., Sunding, D. (2018). Cost of California's 2015 Drought Water Conservation Mandate Davis, California, *Agricultural and Resource Economics Update*, 21(4), 9-11.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
AEC 724 - 001	3.00000 - 3.00000	4	10 Fall 2020-2021
AEC 445G - 001	3.00000 - 3.00000	28	30 Spring 2019-2020
AEC 790 - 002	3.00000 - 9.00000	1	30 Spring 2019-2020
AEC 790 - 003	3.00000 - 9.00000	1	10 Fall 2019-2020
AEC 445G - 001	3.00000 - 3.00000	33	30 Spring 2018-2019
AEC 790 - 002	3.00000 - 9.00000	1	30 Spring 2018-2019
AEC 724 - 001	3.00000 - 3.00000	6	10 Fall 2018-2019
AEC 399 - 002	1.00000 - 6.00000	1	30 Spring 2017-2018
AEC 445G - 001	3.00000 - 3.00000	30	30 Spring 2017-2018
AEC 767 - 012	2.00000 - 2.00000	1	30 Spring 2017-2018
AEC 724 - 001	3.00000 - 3.00000	3	10 Fall 2017-2018
AEC 767 - 009	2.00000 - 2.00000	1	10 Fall 2017-2018
AEC 445G - 001	3.00000 - 3.00000	27	30 Spring 2016-2017
AEC 724 - 001	3.00000 - 3.00000	3	30 Spring 2016-2017
AEC 767 - 012	2.00000 - 2.00000	1	30 Spring 2016-2017
AEC 780 - 015	1.00000 - 3.00000	1	30 Spring 2016-2017
AEC 767 - 009	2.00000 - 2.00000	1	10 Fall 2016-2017
AEC 780 - 004	1.00000 - 3.00000	1	10 Fall 2016-2017
AEC 445G - 001	3.00000 - 3.00000	34	30 Spring 2015-2016
AEC 767 - 012	2.00000 - 2.00000	1	30 Spring 2015-2016
AEC 780 - 015	1.00000 - 3.00000	1	30 Spring 2015-2016
AEC 790 - 002	3.00000 - 9.00000	1	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
AEC 445G - 001	14	4.86	4.64	30 Spring 2019-2020
AEC 445G - 001	20	2.95	3.65	30 Spring 2018-2019
AEC 445G - 001	24	2.74	3.00	30 Spring 2017-2018

AEC 445G - 001	19	2.63	2.84	30 Spring 2016-2017
AEC 445G - 001	16	3.19	3.25	30 Spring 2015-2016
AEC 724 - 001	6	4.67	4.67	10 Fall 2018-2019

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Dissertation Committee Co-Chair

Lingxiao Wang, Status: In-Process, Expected Completion Date: May 2021. (August 2019 - Present).

Mehdi Nemati, Doctoral, "Essays on Environmental Economics and Policy," Status: Degree Awarded, Dr. Wuyang Hu. (September 3, 2015 - May 18, 2018).

Dissertation Committee Member

Samane Zarebanadkoki, Doctoral, "Essays on Health Economics Using Big Data," Status: Degree Awarded. (September 2015 - December 2019).

GwanSeon Kim, Doctoral, "Utilizing Large Scale Datasets to Evaluate Aspects of a Sustainable Bioeconomy," Status: Degree Awarded. (January 2016 - May 2019).

Jawad Alhashim, Doctoral, Status: Degree Awarded. (October 16, 2016 - December 2018).

Sheila Sagbo, Doctoral, Status: In-Process. (May 2017 - May 2018).

Na Zuo, Doctoral, Status: Degree Awarded. (May 15, 2017).

Shaheer Burney, Ph.D., Status: Degree Awarded. (September 3, 2015 - May 15, 2017).

Master's Thesis Committee Co-Chair

Willie Bedell, Master's, Status: Degree Awarded. (May 2016 - December 15, 2017).

Outside examiner

Ryan Hansen, Economics, Status: In-Process, Expected Completion Date: May 2021. (May 2019 - Present).

Academic Advising

30 Spring 2020-2021, 2 undergraduate students advised, 2 graduate student advised, 0 professional students advised.

10 Fall 2020-2021, 2 undergraduate students advised, 1 graduate student advised.

30 Spring 2019-2020, 1 undergraduate students advised, 2 graduate student advised.

10 Fall 2019-2020, 1 undergraduate students advised, 2 graduate student advised.

30 Spring 2018-2019, 1 undergraduate students advised, 2 graduate student advised.

10 Fall 2018-2019, 1 undergraduate students advised, 3 graduate student advised, 0 professional students advised, 0 interns and residents advised.

30 Spring 2017-2018, 1 undergraduate students advised, 1 graduate student advised, My Ph.d. student, Mehdi Nemati, secured employment as a CE Specialist in the School of Public Policy at the University of California, Riverside.

10 Fall 2017-2018, 2 undergraduate students advised, 3 graduate student advised.

30 Spring 2016-2017, 2 undergraduate students advised, 3 graduate student advised.

10 Fall 2016-2017, 0 undergraduate students advised, 3 graduate student advised.

30 Spring 2015-2016, 0 undergraduate students advised, 3 graduate student advised.

Service

Department Service

Committee Member

Graduate Research Committee, (January 2016 - July 2018).

Faculty Advisor

AEC Department Seminar Organizer, (September 2016 - May 2019).

Second Year Paper Committee, (September 2015 - July 2018).

Graduate Student Workshop, (February 2017 - May 2018).

Organizer

Agri-environmental Data Workshop for Data Analysis and Mapping w/ R., (June 2017).

Professional Service

Conference-Related

AAEA, Topics Leader for the AAEA Annual Summer Conference, (November 2016 - June 2018).

Officer, Secretary

Multi-State Hatch: W4190, (October 2019 - Present).

Reviewer, Journal

Journal Reviewer, (July 2015 - Present).

Professional Development

Professional Memberships

Association of Environmental and Resource Economists. (January 2014 - Present).

Agricultural and Applied Economics Association. (July 2010 - Present).

Awards and Honors

Journal of Agricultural and Resource Economics Outstanding Reviewer--less than ten years of experience. Service, Professional, Recognition Award. (July 2017).

Dr. John J. Cox

College of Agriculture, Food and Environment
Department of Forestry
2016-2021 CV for Annual Performance Review

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

Published

Book, Chapter in Scholarly Book-New

- * Chris, L., Cox, J. J., Spear, S., DeLa Cruz, J., Mueller, L., Ford, M. (2020). Terrestrial wildlife in the post-mined Appalachian landscape: status and opportunities. *Appalachia's coal-mined landscapes.*, Springer, 167-192. doi: <https://doi.org/10.1007/978-3-030-57780-3>

Journal Article, Academic Journal

McDermott, J. R., Leuenberger, W., Haymes, C. A., Clevinger, G. B., Trudeau, J. K., Carter, T. C., Hast, J. T., Jenkins, G. S.W., Bowling, W. E., Cox, J. J. (2020). Safe Use of Butorphanol–Azaperone–Medetomidine to Immobilize Free-Ranging White-tailed Deer, *Wildlife Society Bulletin*, 44(2), 281-291. doi: 10.1002/wsb.1096
| JIF: 1.29

Maigret, T. A., Cox, J. J., Weisrock, D. W. (2020). A spatial genomic approach identifies time lags and historical barriers to gene flow in a rapidly fragmenting Appalachian landscape, *Molecular Ecology*, 29(4), 673-685. doi: 10.1111/mec.15362
| JIF: 7.05

* # Murphy, S., + Augustine, B., + Hast, J., Curry, T., Cox, J. J. (2019). Early genetic outcomes of American black bear reintroductions in the Central Appalachians, USA *no, Ursus*.
| JIF: 1.09

Hackworth, Z. J., Cox, J. J., Felch, J. M., Weegman, M. D. (2019). A Growing Conspiracy: Recolonization of Common Ravens (*Corvus corax*) in Central and Southern Appalachia, USA, *Southeastern Naturalist*, 18(2), 281-296. doi: 10.1656/058.018.0208
| JIF: 0.38

* Augustine, B., Kelly, M., # Murphy, S., Royale, A., Cox, J. J., Chandler, R. (2019). Spatial Capture-Recapture for Categorically Marked Populations with an Application to Genetic Capture-Recapture, *Ecosphere*, 10(4), e02627.
| JIF: 2.67

- Maigret, T. A., Cox, J. J., Yang, J. (2019). Persistent geophysical effects of mining threaten ridgetop biota of Appalachian forests, *Frontiers in Ecology and the Environment*, 17(2), 85-91. doi: 10.1002/fee.1992
WOS Metric Year: 2019 | Category: ECOLOGY | JIF: 9.295 | Rank by JIF: 4/169
Author Role:
Helped transform the student's class project into the paper, helped synthesize the results and write the paper
- * + Maigret, T., Cox, J. J. (2018). *Agkistrodon contortrix hibernacula*, *Herpetological Review*, 49(1), 123.
| JIF: 0.16
- * # Murphy, S., Augustine, B., Adams, J., Waits, L., Cox, J. J. (2018). Integrating multiple genetic detection methods to estimate density of social, territorial carnivores., *Ecosphere*.
| JIF: 2.5
- + Slabach, B., + Hast, J., + Murphy, S., Bowling, W., Crank, D., Jenkins, G., Johannsen, K., Cox, J. J. (2018). Survival and cause-specific mortality of elk (*Cervus canadensis*) in Kentucky, USA, *Wildlife Biology*.
| JIF: 2.08
- # Murphy, S., Adams, J., Cox, J. J., Waits, L. (2018). Substantial red wolf genetic ancestry persists in wild canids of southwestern Louisiana, *Conservation Letters*.
| JIF: 7.4
- * + Spaulding, S., Cox, J. J., + Maigret, T., Drayer, A., Richards, J., + Treanor, J. (2018). Occurrence of *Batrachochytrium dendrobatidis* in plethodontid salamanders following timber harvests in southeastern Kentucky, *Herpetological Review*, 49(2), 258-262.
| JIF: 0.16
- * + Haymes, C., + McDermott, J., Jenkins, G., Bowling, W., + Hast, J., Johannsen, K., Cox, J. J. (2018). Survival and cause-specific mortality of white-tailed deer in southeastern Kentucky, *Journal of the Proceedings of the Association of the Southeastern Fish and Wildlife Agencies*, 5, 90-96.
| JIF: N/A
- * Muller, L., Lupardus, J., Murrow, J., Clark, J., Yarkovich, J., Stiver, W., Delozier, E., + Slabach, B., Cox, J. J., Miller, B. (2018). Genetic Structure in Elk Persists after Translocation, *Journal of Wildlife Management*, 82(6), 1124-1134.
| JIF: 1.9
- + Hackworth, Z. J., Lhotka, J. M., Cox, J. J., Barton, C. D., Springer, M. T. (2018). First-Year Vitality of Reforestation Plantings in Response to Herbivore Exclusion on Reclaimed Appalachian Surface-Mined Land, *Forests*, 9(4), 222.
| JIF: 2.116
- Kristensen, T. V., Puckett, E. E., Landguth, E. L., Belant, J. L., Hast, J. T., Carpenter, C., Sajecki, J. L., Beringer, J., Means, M., Cox, J. J., Eggert, L. S., White, D., Smith, K. G. (2018). Spatial

- genetic structure in American black bears (*Ursus americanus*): Female philopatry is variable and related to population history, *Heredity*, 120(4), 329-341. doi: 10.1038/s41437-017-0019-0
- * + Slabach, B., ^ McKinney, A., ^ Cunningham, J., + Hast, J., Cox, J. J. (2018). A Survey of Tick Species in a Recently Reintroduced Population of Elk: Implications for Interstate Translocation of Zoonotic Vectors, *Journal of Wildlife Diseases*, 54(2), 366-370. | JIF: 1.55
- * Cox, J. J., + Murphy, S. M., + Augustine, B. C., + Guthrie, J. M., + Hast, J. T., Maehr, S. C., + McDermott, J. (2017). Seroprevalence of *Toxoplasma gondii* in American Black Bears (*Ursus americanus*) of the Central Appalachians, USA, *Journal of Wildlife Diseases*, 53(3), 671-673. doi: doi.org/10.7589/2016-08-188 | JIF: 1.552
- Murphy, S. M., Augustine, B. C., Ulrey, W. A., Guthrie, J. M., Scheick, B. K., McCown, J. W., Cox, J. J. (2017). Consequences of severe habitat fragmentation on density, genetics, and spatial capture-recapture analysis of a small bear population, *PLoS ONE*, 12(7). doi: 10.1371/journal.pone.0181849
- * + Murphy, S. M., + Ulrey, W. A., + Guthrie, J. M., Maehr, D. S., Abrahamson, W. G., Maehr, S. C., Cox, J. J. (2017). Food habits of a small Florida black bear population in an endangered ecosystem., *Ursus*, 28(1), 92-104. doi: https://doi.org/10.2192/URSU-D-16-00031.1 | JIF: 1.09
- Cox, J. J., + Slabach, B., + Hast, J. T., + Murphy, S. M., Kwok, O. C., Dubey, J. P. (2017). High seroprevalence of *Toxoplasma gondii* in elk (*Cervus canadensis*) of the central Appalachians, USA, *Parasitology Research*, 116(3), 1079-1083. doi: 10.1007/s00436-017-5391-4 | JIF: 2.33
- + Cilles, S. E., ^ Coy, G., + Stieha, C. R., Cox, J. J., Crowley, P. H., Maehr, D. S. (2016). A comparison of seed predation, seed dispersal, and seedling herbivory in oak and hickory; species with contrasting regenerating abilities in a Bluegrass savanna-woodland habitat., *Northeastern Naturalist*, 23(4), 466-481. doi: https://doi.org/10.1656/045.023.0404 | JIF: 0.57
- * + Murphy, S. M., Cox, J. J., + Augustine, B., + Hast, J. T., + Guthrie, J. M., + Wright, J., + McDermott, J., Maehr, S., Plaxico, J. (2016). Characterizing recolonization by a reintroduced bear population using genetic spatial capture–recapture, *Journal of Wildlife Management*, 80(8), 1390-1407. doi: 10.1002/jwmg.21144 | JIF: 1.73
- Cilles, S. E., Coy, G., Stieha, C. R., Cox, J. J., Crowley, P., Maehr, D. S. (2016). A Comparison of Seed Predation, Seed Dispersal, and Seedling Herbivory in Oak and Hickory: Species with Contrasting Regenerating Abilities in a Bluegrass Savanna-Woodland Habitat, *Northeastern Naturalist*, 23(4), 466-481. doi: 10.1656/045.023.0404

Sponsored Projects

Awarded

- Cox J., J., Springer M., T., Elk Neonate Survival and Cause Specific Mortality, Sponsored by Rocky Mountain Elk Foundation Submitted: October 6, 2020. Funding Dates: October 28, 2020 - October 29, 2022. | Awarded: \$11,000.00
OSPA ID: 202010061034
- Springer M., T., Cox J., J., Evaluating Small Mammal Populations and their Response to Cover Crop Management., Sponsored by Natural Resources Conservation Service Submitted: June 14, 2019. Funding Dates: September 11, 2019 - September 30, 2021. Requested: \$75,000.00, | Awarded: \$75,000.00
OSPA ID: 201906141530
- Cox J., J., Springer M., T., Estimating Reproductive Rates of Cow Elk and Calf Survival in Southeast Kentucky, Sponsored by KY Department of Fish and Wildlife Submitted: August 5, 2020. Funding Dates: July 31, 2020 - June 30, 2021. | Awarded: \$250,000.00
OSPA ID: 202008051015

Closed

- Cox J., J., Springer M., T., Estimating Reproductive Rates of Cow Elk and Calf Survival in Southeast Kentucky, Sponsored by KY Department of Fish and Wildlife Submitted: July 15, 2019. Funding Dates: November 27, 2019 - June 30, 2020. | Awarded: \$160,000.00
OSPA ID: 201907151224
- Cox J., J., Demographic And Genetic Status Of A Reintroduced River Otter Population In North-central New Mexico, Sponsored by New Mexico Department of Fish and Game Submitted: August 15, 2017. Funding Dates: January 1, 2018 - June 30, 2019. Requested: \$49,894.00, | Awarded: \$67,670.00
OSPA ID: 201708150748
- Cox J., J., Survival, Cause-Specific Mortality, and Natality of White-tailed Deer in Southeast Kentucky, Sponsored by KY Department of Fish and Wildlife Submitted: June 16, 2016. Funding Dates: September 23, 2016 - June 20, 2017. Requested: \$57,860.00, | Awarded: \$55,230.00
OSPA ID: 201606160809
- Cox J., J., Survival, cause-specific mortality, and natality of white-tailed deer in southeastern Kentucky, Sponsored by KY Department of Fish and Wildlife Submitted: May 17, 2015. Funding Dates: July 1, 2015 - May 31, 2016. | Awarded: \$140,200.00
OSPA ID: 201505170739
- Cox J., J., Cow and Calf Elk Survival and Cause-Specific Mortality, Sponsored by Rocky Mountain Elk Foundation Submitted: September 2, 2014. Funding Dates: July 23, 2014 - May 1, 2016. | Awarded: \$29,200.00
OSPA ID: 201409021041

Not Funded

- Cox J., J., Krupa J., KSEF RDE: A landscape genetic analysis of the impacts of habitat fragmentation on copperhead populations of southeastern Kentucky, Sponsored by KY Science and Technology Co Inc Submitted: January 6, 2016. Requested: \$28,740.00, | Awarded: \$0.00
OSPA ID: 201601060800
- Cox J., J., Post-Release Survival and Spatial Ecology of Captive-Rehabilitated Bobcats in the Urban-Wildland Interface, Sponsored by Arizona Game and Fish Department Submitted:

November 19, 2018. | Awarded: \$0.00

OSPA ID: 201811191327

Hickman J., B., Cox J., J., Harris D., C., Ochuodho T., O., Price S., J., Springer M., T., Stringer J., W., Yang J., Rogersville Shale Energy and Environment Laboratory (RSEEL), Sponsored by

Department of Energy Submitted: August 16, 2017. | Awarded: \$0.00

OSPA ID: 201708161425

Pending

Cox J., J., Springer M., T., Chronic Wasting Disease (CWD) Epidemiologic Risk Assessment of Farmed Cervids and Free Ranging Cervids in Kentucky, Sponsored by KY Department of

Agriculture Submitted: October 6, 2020. | Awarded: \$0.00

OSPA ID: 202010061033

Non-Sponsored Projects

Department

On-going

Maigret, T., Cox, J. J., Travel Award, UK Forestry, (2017). Awarded: \$1000.

Description: Funding to travel to present at professional conference. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Shaffer, J., Cox, J. J., Travel Award, UK Forestry, (2016). Awarded: \$1000.

Description: Funding to travel to present at professional conference. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Federal

McIntire-Stennis

Closed

Cox, J. J., Autecology and population dynamics of reintroduced elk in a denatured landscape of Appalachia: implications for management of Kentucky's mixed-mesophytic forest, (November 9, 2015 - September 30, 2019).

On-going

Cox, J. J., Autecology and population dynamics of elk in fragmented forests of Appalachia, (December 18, 2019 - September 30, 2024).

Cox, J. J., Autecology and population dynamics of reintroduced elk in a denatured landscape of Appalachia: implications for management of Kentucky's mixed-mesophytic forest, National Institute of Food and Agriculture, (November 9, 2015 - September 30, 2019).

Foundation

On-going

Cox, J. J. (Principal), Hatfield, S. (Grad/Prof Student), Mara Raptor Project, Band Foundation, (September 2018 - May 2023). Awarded: \$150000.

Description: Funding to continue martial eagle research and expand it to other raptors in the Mara Region of Kenya

Hackworth, Z., Cox, J. J., Assessing impacts of streamsize management zones on breeding bird communities., Kentucky Ornithological Society, (2017). Awarded: \$1000.

Description: Funding to conduct research. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Hatfield, S. (Co-Principal), Cox, J. J. (Co-Principal), Martial eagle ecology in the Mara region of Kenya., Peregrine Fund, (2017 - Present). Awarded: \$8000.

Description: Funding to conduct research. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Hatfield, S., Cox, J. J., American Kestrel nest box project, Kentucky Audubon Society, (2016).

Awarded: \$970.

Description: Funding to build nest boxes and install at UK farms and other facilities. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Hatfield, S. (Co-Principal), Cox, J. J. (Co-Principal), Martial eagle ecology in the Mara region of Kenya., Peregrine Fund, (2016 - Present). Awarded: \$3000.

Description: Funding to conduct research. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

State

On-going

Cox, J. J. (Co-Investigator), Jeff, L. L. (Co-Investigator), Factors affecting habitat selection of GPS-collared elk at multiple scales in Pennsylvania., Pennsylvania Game Commission, (June 2019 - Present). Awarded: \$399369.

Description: Proposal was funded and awarded to Indiana University of Pennsylvania. UK is not a recipient of any funding, although J. Cox is a co-principal investigator of the work and co-wrote the proposal.

University

Not Funded

Cox, J. J., Barton, C. D., Lhotka, J. M., Springer, M. T., Hackworth, Z. (Grad/Prof Student), Utilizing Herbivore Exclusion Techniques to Improve the Success of Surface Mine Restoration Efforts, University of Kentucky Sustainability Grant. Awarded: \$17000.

On-going

Sena, K. (Co-Principal), Cox, J. J. (Co-Principal), Lhotka, J. M. (Co-Principal), Reforest the

Bluegrass: Evaluating twenty years of urban reforestation in Lexington, 2020 University of Kentucky Sustainability Challenge Grant program, (March 2020 - 2021). Awarded: \$41317.

Hatfield, S., Cox, J. J., The ecology of the Martial Eagle in Southern Kenya, UK Student Sustainability Challenge Grant, (2017). Awarded: \$6500.

Description: Funding to conduct research and outreach to students in classroom. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Hackworth, Z. (Co-Principal), Cox, J. J. (Co-Principal), Mammalian herbivory impacts on surface mine reforestation in southeastern KY., Karri Casner Environmental Sciences Fellowship, (2017 - Present). Awarded: \$3500.

Description: Funding to conduct research. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Slabach, B., Cox, J. J., Travel Award, UK Forestry and UK Grad School, (2016). Awarded: \$1050.

Description: Funding to travel to present at professional conference. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Slabach, B., Cox, J. J., Travel Award, University of Washington, (2016). Awarded: \$1800.

Description: Funding to travel to attend a workshop. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Hatfield, S. (Co-Principal), Cox, J. J. (Co-Principal), Long-term genetic consequences of red wolf-coyote hybridization and demographics of a large canid in Kentucky,, Karri Casner Environmental Sciences Fellowship, (2016 - Present). Awarded: \$4900.

Description: Funding to conduct research. Note this is a grad student only submission process, with the student working with the PI faculty sponsor in his research lab. Because there is no category for this in Digital Measures, note this was funded.

Presentations Given

Invited Speaker

Maigret T., Cox J. J., Yang J., (February 21, 2018). Landscape-level effects of surface mining on Appalachian biodiversity: from population genetics to ecosystems. Sharing Work in Appalachia Progress, UK Appalachia Center, Lexington, KY, United States. Invited, Regional.

Hackworth Z., Lhotka J., Cox J. J., Barton C., Springer M., (February 21, 2018). Mammal Herbivory Impacts on Surface Mine Reclamation and Reforestation in Southeastern KY Sharing Work on Appalachia in Progress, UK Appalachian Center, Lexington, KY, United States. Invited, Regional.

Podium Session

- Cox J. J., (September 22, 2020). A Historical perspective of Kentucky's elk reintroduction program: or how we learned to stop worrying and love stochasticity. The Wildlife Society Annual Meeting, The Wildlife Society, Louisville (virtual), KY, United States. Accepted, International.
- Williams K. E., Hooven N. D., Fusaro J. L., McDermott J. R., Crank R. D., Sams K., Casey C., Jenkins G., Springer M. T., Cox J. J., (May 2020). Elk calf survival, blood parameters, and parturition site selection in southeastern Kentucky. Eastern Elk Management Workshop Meeting (Virtual), Eastern Elk Management Committee, Virtual, MN, United States. Accepted, International.
- Nierman J. L., Springer M. T., Cox J. J., Leuenberger W., Davis A., (February 2020). Holey Voley: Cover crop modification and the impact on vole population dynamics. Kentucky Chapter of The Wildlife Society Annual Meeting, KY Chapter of The Wildlife Society, Jamestown, KY, United States. Accepted, National.
- Wolf G., Cox J. J., Springer M. T., (October 4, 2019). Diet of a reintroduced population of river otters in the Upper-Rio Grande River, Taos county, New Mexico. AFS & TWS Joint Meeting, The Wildlife Society, Reno, NV, United States. Accepted, National.
- Hackworth Z. J., Lhotka J. M., Cox J. J., Barton C. D., Springer M. T., (2018). First-year vitality of reforestation plantings in response to herbivore exclusion on reclaimed Appalachian surface-mined land. Annual Meeting of the Kentucky Chapter of The Wildlife Society, KY TWS, Cadiz, KY, United States. Accepted, State.
- Lisette W., Adams J., Cox J. J., Murphy S., (October 7, 2018). Persistence of red wolf ancestry in southwestern Louisiana despite decades of unmitigated hybridization. The Wildlife Society Annual Conference, The Wildlife Society, Cleveland, OH, United States. Accepted, International.
- Maigret T., Cox J. J., Yang J., (July 12, 2018). Persistent geophysical effects of mining threaten ridgetop biota of Appalachian forests. Joint Meeting of Ichthyologists and Herpetologists, Rochester, NY, United States. Accepted, International.
- Ben A., Royle J., Chandler R., Cox J. J., Kelly M., (July 2, 2018). Spatial capture-recapture for categorically marked populations with an application to genetic capture-recapture. International Statistical Ecology Conference, St Andrews, United Kingdom. Accepted, International.
- Cox J. J., Murphy S. M., Slabach B., Augustine B. C., Hast J. T., Guthrie J. M., McDermott J., Maehr S. C., Kwok O. C., Dubey J. P., (September 2017). High seroprevalence of *Toxoplasma gondii* in two large mammals of the central Appalachians, USA. The Wildlife Society Annual Meeting, The Wildlife Society, Albuquerque, NM, United States. Accepted, International.
- Slabach B., Hast J. T., Bowling W., Crowley P. H., Crank R. D., Jenkins G., Cox J. J., (September 2017). Mortality and human predation: how sociality influences probability of mortality of large mammals. The Wildlife Society Annual Meeting, The Wildlife Society, Albuquerque, NM, United States. Accepted, International.

- Murphy S. M., Cox J. J., Augustine B. C., Hast J. T., Guthrie J. M., Plaxico J. H., Maehr S. C., Strunk M., Curry T. M., (September 2017). Population dynamics and harvest sustainability of two small, reintroduced American black bear populations. The Wildlife Society Annual Meeting, The Wildlife Society, Albuquerque, NM, United States. Accepted, International.
- Murphy S. M., Cox J. J., Augustine B. C., Hast J. T., Guthrie J. M., Plaxico J. H., Maehr S. C., Strunk M., Curry T. M., (February 2017). Population viability, reintroduction success, and harvest sustainability of black bear populations in Kentucky. Kentucky Chapter The Wildlife Society Annual Meeting, KY Chapter The Wildlife Society, KY, United States. Accepted, Regional.
- Maigret T., Cox J. J., (February 2017). Surface coal mining removes preferred hibernacula habitat of timber rattlesnakes in the Cumberland Plateau of Kentucky. Kentucky Chapter The Wildlife Society Annual Meeting, KY Chapter The Wildlife Society, KY, United States. Accepted, Regional.
- Maigret T., Cox J. J., (February 2017). Surface coal mining removes preferred hibernacula habitat of timber rattlesnakes in the Cumberland Plateau of Kentucky. Southeastern Partners in Amphibian Conservation, Southeastern Partners in Amphibian Conservation, Little Rock, AR, United States. Accepted, Regional.
- Shaffer J., Reed D. J., Bate C., Gleeson S. K., Cox J. J., (September 2016). Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland remnant. Joint Fire Council Annual Meeting, KY and TN Joint Fire Council, Ft. Campbell, KY, United States. Accepted, Regional.
- Shaffer J., Reed D. J., Bate C., Gleeson S. K., Cox J. J., (August 2016). Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland remnant. Ecological Society of America Annual Conference, Ecological Society of America, Ft. Lauderdale, FL, United States. Accepted, International.
- McDermott J. R., Haymes C. A., Jenkins G., Bowling W., Hast J. T., Sams K., Cox J. J., (August 2016). Southeastern Kentucky white-tailed deer project. Midwestern Deer and Turkey Study Group Meeting., Midwestern Deer and Turkey Study Group Meeting., Carrolton, KY, United States. Accepted, Regional.
- McDermott J. R., Haymes C. A., Jenkins G., Bowling W., Hast J. T., Sams K., Cox J. J., (August 2016). White-tailed deer fawn survival in a southeastern Kentucky population. Midwestern Deer and Turkey Study Group Meeting., Midwestern Deer and Turkey Study Group Meeting., Carrolton, KY, United States. Accepted, Regional.
- Slabach B., Cox J. J., (August 2016). All in the family? linking sociality and relatedness to group dynamics of large mammals. The Wildlife Society Annual Meeting, The Wildlife Society, Raleigh, NC, United States. Accepted, International.
- McDermott J., Haymes C., Cox J. J., Jenkins G., Hast J., Bowling W., Sams K., Augustine B., Matykiewicz B., Johannsen K., (August 2016). White-tailed deer fawn survival in a southeastern Kentucky population. The Wildlife Society Annual Meeting, The Wildlife Society, Raleigh, NC, United States. Accepted, International.

Jim S., Scott G., Cox J. J., Lhotka J., (August 11, 2016). Prescribed fire intensity and severity in an experimentally restored Bluegrass savanna-woodland. Ecological Society of America Annual Meeting, Ecological Society of America, Louisville, KY, United States. Accepted, International.

Shaffer J., Reed D. J., Bate C., Gleeson S. K., Cox J. J., (May 2016). Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland remnant. Conference of Ecological and Evolutionary Biology, UK Biology, Lexington, KY, United States. Accepted, University.

Haymes C. A., McDermott J. R., Jenkins G., Bowling W., Hast J. T., Sams K., Cox J. J., (February 2016). White-tailed deer fawn survival in a southeastern Kentucky population. Midwestern Deer and Turkey Study Group Meeting., Midwestern Deer and Turkey Study Group, Raleigh, NC, United States. Accepted, Regional.

Poster Session

Williams K. E., Hooven N. D., Fusaro J. L., McDermott J. R., Crank R. D., Sams K., Casey C., Jenkins G., Springer M. T., Cox J. J., (February 2020). Survival and cause specific mortality of elk calves in Kentucky Annual Meeting of The Kentucky Chapter of the Wildlife Society, Kentucky Chapter of the Wildlife Society, Jamestown, KY, United States. Accepted, State.

Nierman J. L., Springer M. T., Cox J. J., Leuenberger W., Davis A., (October 2019). Holey Voley: Cover crop modification and the impact on vole population dynamics. AFS & TWS Joint Meeting, The Wildlife Society, Reno, NV, United States. Accepted, National.

Wolf G., Cox J. J., Springer M. T., (February 2019). Diet of a newly reintroduced river otter species in the upper Rio Grande River, New Mexico. Annual Meeting of The Kentucky Chapter of The Wildlife Society, Kentucky Chapter of The Wildlife Society, Lucas, KY, United States. Accepted, State.

Adam W., Jason U., Gabe W., Cox J. J., (February 21, 2019). Test your metal: presence and analysis of heavy metals in New Mexico otter scat Annual Meeting of the KY Chapter of the Wildlife Society, KY Chapter of the Wildlife Society, KY, United States. Accepted, National.

Matthews J., Springer M. T., Cox J. J., (2018). Impacts and influences of deer densities on corn and soybean yields in Western Kentucky. 41st Southeast Deer Study Group Meeting, Southeast Deer Study Group, Nashville, TN, United States. Accepted, National.

Wolf G., Cox J. J., Springer M. T., (2018). Diet of a newly reintroduced river otter species in the upper Rio Grande River, New Mexico. 78th Midwest Fish and Game Conference, Midwest Fish and Wildlife Agencies, Milwaukee, WI, United States. Accepted, Regional.

Matthews J., Springer M. T., Cox J. J., (2018). Impacts and influences of deer densities on corn and soybean yields in Western Kentucky. 78th Midwest Fish and Game Conference, Midwest Fish and Wildlife Agencies, Milwaukee, WI, United States. Accepted, Regional.

Wolf G., Cox J. J., Springer M. T., (2018). Diet of a newly reintroduced river otter species in the upper Rio Grande River, New Mexico. Annual Meeting of the Kentucky Chapter of The Wildlife Society, KY TWS, Cadiz, KY, United States. Accepted, State.

Matthews J., Springer M. T., Cox J. J., (2018). Impacts and influences of deer densities on corn and soybean yields in Western Kentucky. Annual Meeting of the Kentucky Chapter of The Wildlife Society, KY TWS, Cadiz, KY, United States. Accepted, State.

Wolf G., Cox J. J., Springer M. T., (October 11, 2018). Diet of a newly reintroduced river otter species in the upper Rio Grande River, New Mexico. The Wildlife Society 25th Annual Conference, The Wildlife Society, Cleveland, OH, United States. Accepted, International.

Matthews J., Springer M. T., Cox J. J., (October 11, 2018). Pellets or pictures: Which would you prefer to count? A comparison of two white-tailed deer population survey techniques The Wildlife Society 25th Annual Conference, The Wildlife Society, Cleveland, OH, United States. Accepted, International.

Maigret T., Cox J. J., Yang J., (December 6, 2017). Persistent geophysical effects of mining threaten ridgetop biota of Appalachian forests. 7th Annual Sustainability Forum, UK, Lexington, KY, United States. Accepted, National.

Extension

Extension Publications & Media

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

Published

Non Peer-Reviewed

Journal Article, In-House Journal

Cox, J. J. (2019). Coyotes in the Commonwealth Lexington KY, *Kentucky Woodlands Magazine*, 13(1), 20-21.

Media Contributions

Magazine

"Yes!" (April 13, 2019). Article on restoring minelands that was heavily informed on wildlife issues, mainly elk, by J. Cox., United States.

Radio

"From the Woods Kentucky Radio-podcast." (April 22, 2019). Podcast discussing the history of the environmental/conservation history, Earth Day, sustainability, and land stewardship. Lexington, KY, United States.

"From the Woods Kentucky Radio-podcast." (April 15, 2019). Podcast interview of Gabie Wolf, graduate student working on river otter ecology in New Mexico. Lexington, KY, United States.

"From the Woods Kentucky radio/podcast." (December 20, 2018). Radio-podcast on white-tailed deer ecology with discussion of management in Kentucky and beyond. Lexington, KY, United States.

"From the Woods Kentucky podcast." (September 20, 2018). Podcast by grad student Stratton Hatfield on our eagle research in Kentucky. Lexington, KY, United States.

"From the Woods Kentucky." (September 13, 2018). Radio program segment on black bears in KY. Lexington, KY, United States.

TV

"Kentucky Afield." (August 2020). TV program with segment interviewing grad students working on our elk research project. Frankfort, KY, United States.

"WKYT News." (July 26, 2018). Story about red foxes and public interaction at a Lexington park. Lexington, KY, United States.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
FOR 748 - 006	0.00000 - 0.00000	1	10 Fall 2020-2021
FOR 748 - 014	0.00000 - 0.00000	1	50 Summer 2019-2020
FOR 101 - 001	3.00000 - 3.00000	37	30 Spring 2019-2020
FOR 365 - 001	2.00000 - 2.00000	12	30 Spring 2019-2020
FOR 435 - 001	3.00000 - 3.00000	37	30 Spring 2019-2020
FOR 435 - 002	3.00000 - 3.00000	58	30 Spring 2019-2020
FOR 550 - 001	3.00000 - 3.00000	4	30 Spring 2019-2020
FOR 599 - 005	1.00000 - 3.00000	1	30 Spring 2019-2020
FOR 748 - 005	0.00000 - 0.00000	1	30 Spring 2019-2020
FOR 781 - 005	1.00000 - 3.00000	1	30 Spring 2019-2020
FOR 791 - 005	1.00000 - 3.00000	1	30 Spring 2019-2020
FOR 748 - 006	0.00000 - 0.00000	1	10 Fall 2019-2020
FOR 748 - 014	0.00000 - 0.00000	1	50 Summer 2018-2019
FOR 101 - 001	3.00000 - 3.00000	45	30 Spring 2018-2019
FOR 365 - 001	2.00000 - 2.00000	14	30 Spring 2018-2019
FOR 435 - 001	3.00000 - 3.00000	46	30 Spring 2018-2019
FOR 435 - 002	3.00000 - 3.00000	61	30 Spring 2018-2019
FOR 748 - 006	0.00000 - 0.00000	3	10 Fall 2018-2019
HON 398 - 017	3.00000 - 15.00000	1	10 Fall 2018-2019
FOR 365 - 001	2.00000 - 2.00000	15	30 Spring 2017-2018
FOR 435 - 001	3.00000 - 3.00000	64	30 Spring 2017-2018
FOR 748 - 005	0.00000 - 0.00000	2	30 Spring 2017-2018

FOR 101 - 001	3.00000 - 3.00000	29	10 Fall 2017-2018
FOR 748 - 006	0.00000 - 0.00000	4	10 Fall 2017-2018
FOR 770 - 003	1.00000 - 1.00000	4	10 Fall 2017-2018
FOR 748 - 023	0.00000 - 0.00000	4	52 2nd summer 2016-2017
FOR 748 - 014	0.00000 - 0.00000	4	51 1st summer 2016-2017
FOR 365 - 001	2.00000 - 2.00000	12	30 Spring 2016-2017
FOR 435 - 001	3.00000 - 3.00000	36	30 Spring 2016-2017
FOR 695 - 001	0.00000 - 0.00000	1	30 Spring 2016-2017
FOR 748 - 005	0.00000 - 0.00000	4	30 Spring 2016-2017
FOR 770 - 002	1.00000 - 1.00000	8	30 Spring 2016-2017
FOR 781 - 005	1.00000 - 3.00000	1	30 Spring 2016-2017
FOR 101 - 001	3.00000 - 3.00000	16	10 Fall 2016-2017
FOR 695 - 001	0.00000 - 0.00000	1	10 Fall 2016-2017
FOR 748 - 006	0.00000 - 0.00000	4	10 Fall 2016-2017
FOR 770 - 002	1.00000 - 1.00000	7	10 Fall 2016-2017
FOR 748 - 023	0.00000 - 0.00000	3	52 2nd summer 2015-2016
FOR 748 - 014	0.00000 - 0.00000	4	51 1st summer 2015-2016
FOR 356 - 001	5.00000 - 5.00000	8	30 Spring 2015-2016
FOR 748 - 005	0.00000 - 0.00000	4	30 Spring 2015-2016
FOR 781 - 005	1.00000 - 3.00000	1	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
FOR 101 - 001	9	4.56	4.56	30 Spring 2019-2020
FOR 101 - 001	21	4.52	4.57	30 Spring 2018-2019
FOR 101 - 001	14	4.57	4.71	10 Fall 2017-2018
FOR 101 - 001	5	5.00	4.80	10 Fall 2016-2017
FOR 365 - 001	11	3.82	4.18	30 Spring 2017-2018
FOR 435 - 001	9	4.44	4.56	30 Spring 2019-2020
FOR 435 - 001	21	4.00	4.43	30 Spring 2018-2019
FOR 435 - 001	27	3.85	4.27	30 Spring 2017-2018
FOR 435 - 001	20	3.75	3.90	30 Spring

				2016-2017
FOR 435 - 002	22	4.18	4.32	30 Spring 2019-2020
FOR 435 - 002	20	3.80	4.05	30 Spring 2018-2019
FOR 770 - 002	5	3.40	4.00	10 Fall 2016-2017

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Dissertation Committee Chair

Allison Davis, Forestry and Natural Resources, Status: In-Process, Expected Completion Date: May 2024. (August 2020 - Present).

Dissertation Committee Co-Chair

Stratton Hatfield, Ecology (Wageningen University, The Netherlands), Status: In-Process, Frank van Langeveld, Expected Completion Date: May 2024. (July 2019 - Present).

James Shaffer, Biology, Status: In-Process. (August 2013 - Present).

Tom Maigret, Biology, "Landscape ecology and population genomics of two sympatric pit viper species across a fragmented Appalachian landscape. Ph.D. Dissertation.," Status: Degree Awarded, David Weisrock. (January 2014 - April 2020).

John Hast, Animal and Food Sciences, "Vital rates and habitat selection of bull elk (*Cervus canadensis nelsoni*) in southeastern Kentucky. Ph.D. Dissertation.," Status: Degree Awarded, Michael Lacki. (August 2010 - December 2019).

Brittany Slabach, Biology, "The role of sociality and disturbance in shaping elk (*Cervus canadensis*) population structure. Ph.D. Dissertation.," Status: Degree Awarded, Phil Crowley. (August 2012 - September 2018).

Sean Murphy, Animal Sciences, "Ecology of two reintroduced black bear populations in the central Appalachians.," Status: Degree Awarded. (August 2013 - May 2016).

Dissertation Committee Member

Karina Garcia, Entomology, Status: In-Process, Expected Completion Date: May 2022. (August 2018 - Present).

Ben Cloud, Biology, Status: In-Process. (August 2014 - Present).

Nathan Klar, Biology, Status: Inactive. (July 2013 - Present).

Patricia Hartman, Biology, Status: Inactive. (2007 - Present).

Master's Thesis Committee Chair

Kai Davis, Forestry and Natural Resources, Status: In-Process, Expected Completion Date: May 2023. (August 2020 - Present).

Alejandra Betancourt, Forestry, Status: Inactive. (August 2012 - Present).

Pavan Podapati, Forestry, Status: In-Process. (August 2012 - Present).

Trish Regard, Forestry, Status: In-Process. (August 2012 - Present).

Stratton Hatfield, Forestry, "DIET AND SPACE USE OF THE MARTIAL EAGLE (POLEMAETUS BELLICOSUS) IN THE MAASAI MARA REGION OF KENYA," Status: Degree Awarded. (August 2015 - September 2018).

Joshua Felch, Forestry and Natural Resources, "Detectability and occupancy of the Common Raven in cliff habitat of Central Appalachia and southeastern Kentucky.," Status: Degree Awarded. (January 2009 - February 2018).

Caleb Haymes, Forestry and Natural Resources, "Survival and cause-specific mortality of a southeastern Kentucky deer population.," Status: Degree Awarded. (August 2013 - December 2017).

Aaron Hildreth, Forestry and Natural Resources, "Establishment of serological reference ranges for elk in Kentucky and effects of quarantine and translocation on elk.," Status: Degree Awarded. (August 2011 - July 2017).

Joe McDermott, Forestry, "Survival and cause-specific mortality of white-tailed deer (*Odocoileus virginianus*) neonates in a southeastern Kentucky population," Status: Degree Awarded. (August 2013 - June 2017).

Master's Thesis Committee Co-Chair

Kathleen Williams, Forestry and Natural Resources, Status: In-Process, Matthew Springer, Expected Completion Date: May 2022. (January 2020 - Present).

Nathan Hooven, Forestry and Natural Resources, Status: In-Process, Matthew Springer, Expected Completion Date: May 2022. (August 2019 - Present).

Gabriela Wolf, Forestry and Natural Resources, "Diet of a recently reintroduced river otter (*Lontra canadensis*) population in Taos County, New Mexico. M.S. Thesis.," Status: Degree Awarded, Matthew Springer. (August 2017 - May 2020).

Johnathan Matthews, Forestry and Natural Resources, "Quantifying white-tailed deer density and its impacts on agricultural systems. M.S. Thesis.," Status: Degree Awarded, Matthew Springer. (August 2017 - April 2019).

Zachary Hackworth, Forestry, "Efficacy of herbivore exclusion on planted tree seedling vitality on a reclaimed surface mine in eastern Kentucky.," Status: Degree Awarded. (August 2016 - April 2018).

Master's Thesis Committee Member

Jena Nieman, Forestry and Natural Resources, Status: In-Process, Expected Completion Date: May 2021. (August 2018 - Present).

Jake Hutton, Forestry, Status: In-Process. (August 2016 - April 2018).

Jennifer McKenzie, Forestry, Status: Completed. (August 2014 - January 2018).

Alexandra Slusher, Forestry, Status: Degree Awarded. (August 2015 - May 2017).

Marissa Thalken, Forestry, Status: Degree Awarded. (August 2015 - May 2017).

Christian Oldham, Forestry, Status: Degree Awarded. (August 2013 - May 2016).

Directed Student Learning (excluding theses, dissertations)

Amanda Stephens. Internship Advisor. *Review of Dahurian Buckthorn literature*. Completed (December 2019 - May 2020).

Description: Review of Dahurian Buckthorn literature

Keely Kohen. Directed Individual/Independent Study. *No official title*. Completed (January 2019 - May 2019).

Description: Assistance with an otter diet study

Adam Waggener. Directed Individual/Independent Study. *Toxicology analysis of heavy metals in New Mexico river otters*. Completed (September 7, 2018 - May 2019).

Description: Faculty advisor for undergrad research on honors capstone project

Emily Ingram. Internship Advisor. *Using camera traps to estimate zebra populations in Kuti Wildlife Reserve, Malawi*. Completed (May 2018 - August 2018).

Description: Faculty internship advisor

Academic Advising

99 Academic year 2020-2021, 11 undergraduate students advised, 11 graduate student advised, 1 interns and residents advised, Served as Wildlife Minor Coordinator the entire year and advisor for one undergrad NRE 399 internship

Served as advisor or coadvisor on 7 M.S. grad committees, and 4 Ph.D grad committees, and

serve as general graduate committee member on 1 M.S. and 2 Ph.D. committees; total of 11 grad student committees. One Ph.D and one M.S. student graduated during the academic year.

99 Academic year 2019-2020, 5 undergraduate students advised, 10 graduate student advised, 5 interns and residents advised, Wildlife Minor Coordinator entire time. Advisor/supervisor for one undergrad BIO 395 undergrad internship, 2 high school, and 2 undergrad research assistants.

Served as advisor or coadvisor on 6 M.S. grad committees and 4 Ph.D grad committees, and serve as general committee member on 1 M.S. and 2 Ph.D. committees, for a total of 13 grad student committees. A total of 2 major advised grad students (1 M.S. 1 Ph.D.) earned their degree during this period.

10 Fall 2018-2019, 4 undergraduate students advised, 12 graduate student advised, 5 interns and residents advised, Began coordinator of Wildlife Minor 9/1/2018; advisor for one undergrad NRE 399 internship (SP-FA 2018), and one undergrad in HON 398 Capstone; 2 official FOR undergrad program advisees;

As of 10/1/18 serve as advisor or coadvisor on 5 M.S. grad committees, and 4 Ph.D grad committees, and serve as general committee member on 1 M.S. and 2 Ph.D. committees; total of 12 grad student committees. Completed service on 5 additional M.S. and 1 doctoral student committees from 10/1/17-9/30/18.

10 Fall 2017-2018, 2 undergraduate students advised, 18 graduate student advised, Advising grad students in my research lab and those on which I serve as a committee member only.

Started advising forestry undergrads for first time.

30 Spring 2016-2017, 18 graduate student advised, Advising grad students in my research lab and those on which I serve as a committee member only.

Program and Curriculum Development

2016

Program/Curriculum Name - Conversion of two undergrad FOR courses to UK Core

Description: Conversion of FOR 101 and FOR 230 into UK Core courses needed for our undergraduate forestry curriculum revision; only the latter course was successfully approved thus far and upgraded to a 400 level course.

Program/Curriculum Name - Forestry wildlife minor development and refinement

Description: Continuation of multi-year effort to develop and refine wildlife minor for Forestry program

2017

Program/Curriculum Name - Forestry wildlife minor development and refinement

Description: Continuation of multi-year effort to develop and refine wildlife minor for Forestry program

2018

Program/Curriculum Name - Wildlife minor

Description: Wildlife Minor program advisement, coordination and implementation

Other Credit and Non-Credit Instructional Activities

Guest Lecture

Foundations in Forestry, Wildlife, and Natural Resource Sciences, Activity Type: Lecture, Delivery Mode: Traditional, Participants: Graduate Students, 15, (October 2020)

Description: 2 lectures during the semester, or ~14% of the class; ethics in forestry, and another on foundations in wildlife sciences

Forest Resource Policy and Law, Activity Type: Lecture, Delivery Mode: Traditional, Participants: Undergraduate Students, 30, (October 2019)

Description: One day guest lecture on ethics in conservation and forestry

Global Issues in Forestry, Participants: Graduate Students, 12, (October 2019)

Description: Apex predators: ecological keystones, conservation flagships

Natural Resource and Environmental Analysis, Participants: Undergraduate Students, 20, (May 2019)

Description: Survey of and techniques used to study vertebrate animals

Natural Resource and Environmental Analysis, Participants: Undergraduate Students, 20, (May 14, 2018)

Description: Survey of and techniques used to study vertebrate animals

Global Issues in Forestry, Participants: Graduate Students, 12, (September 1, 2017)

Description: Apex predators: ecological keystones, conservation flagships

Natural Resource and Environmental Analysis, Participants: Undergraduate Students, 20, (May 16, 2017)

Description: Survey of and techniques used to study vertebrate animals

Participants: Undergraduate Students, 300, (October 10, 2016)

Description: Lecture on topic of applications of STEM to solving problems in wildlife science.
"Getting wild with science."

Natural Resource and Environmental Analysis, Participants: Undergraduate Students, 20, (May 12, 2016)

Description: Survey of and techniques used to study vertebrate animals

Service

Department Service

Committee Chair

Chair, Research Committee, (November 2018 - Present).

Wildlife tech search committee, (November 2016 - February 2017).

Committee Member

Undergraduate Program Committee Member, (January 1, 2014 - Present).

Graduate Student Award of Excellence, (April 2017 - 2018).

Graduate Program Committee Member, (August 1, 2014 - August 2016).

Faculty Advisor

Forestry Advisory Committee to the Chair, (August 1, 2020 - Present).

College Service

Committee Member

CAFE Diversity, Equity, and Inclusion Committee, (December 1, 2020 - Present).

CAFE Faculty Council, (April 2019 - Present).

University Service

Committee Member

UK Sexual Misconduct Hearing Board Committee, (January 2019 - Present).

Faculty Advisor

Wildlife minor coordinator/advisor, (September 1, 2018 - Present).

Professional Service

Editor, Associate Editor

Northeastern Naturalist, Associate editor of journal, (January 1, 2016 - June 2016).

Editor, Book

Springer Books, Co-editor for eastern elk book ecology and management, (January 1, 2016 - Present).

Reviewer, Ad Hoc Reviewer

University of Indiana, (September 2020).

Reviewer, Journal Article

Various scientific journals, Peer review manuscripts submitted to journal, (January 1, 2006 - December 2020).

Media Contributions

Internet

"Washington Post." (April 2, 2019). This is one example of a major news outlet (broadcast, paper, web) that reported on a NAS review of the endangered red wolf. This review heavily relied on our collaborative research on red wolves in the southeastern U.S., published in the peer-reviewed journal, Conservation Letters. Washington DC, DC, United States.

Magazine

"The Wildlife Society Professional (and website)." (December 18, 2018). Article on a major study we collaborated on concerning red wolf genetics in the southeastern U.S. This work was heavily cited in a National Academy of Sciences review that was cited across multiple major news outlets, including TV (e.g. ABC), newspapers (e.g. Washington Post), Environmental News Network, and many others., United States.

"Tracking the elusive Martial eagle. The Magazine: University of Kentucky College of Agriculture. 18:24." (April 2017). Article that focused on Martial Eagle research conducted in Kenya by my research lab. Lexington, KY, United States.

TV

"Kentucky Afield TV Program." (July 6, 2016). Program on deer research in southeastern Kentucky conducted within my lab. Lexington, KY, United States.

"Kentucky Afield Program." (July 5, 2016). Program on our adult deer survival study conducted in southeastern KY within my research lab. Lexington, KY, United States.

"The Weather Channel's Natural Born Monsters TV Series Season 1, Episode 8." (January 2016).
The program focused on the possibility of mountain lions (cougars) recolonizing parts of the eastern U.S. I was interviewed as an expert wildlife witness and one with a research history on Florida panthers and other large mammals. United States.

Professional Development

Professional Memberships

The Aldo Leopold Foundation. International. (July 2012 - October 13, 2018).

Society for Conservation Biology. International. (April 1999 - October 13, 2018).

The Wildlife Society. International. (January 1999 - October 13, 2018).

Development Activities Attended

Seminar

- QPR Suicide Prevention Gatekeeper Program. (September 2016). University of KY. University. Lexington, KY, United States.
A one-hr program focused on suicide and prevention

Workshop

UK Core Evaluation. (October 5, 2018). UK. University. Lexington, KY, United States.
Training to evaluate assignments in UK Core courses to evaluate whether they meet assessment goals.

University Employee Training

Unconscious Bias Training. (May 24, 2017). University of Kentucky. University. Lexington, KY, United States.
University sponsored unconscious bias training

Awards and Honors

(Research Lab) Student best student presentation. KY-TN Joint Fire Council Meeting. Other, Recognition Award. (2016).

(Research Lab) Student best student presentation. Tracy Farmer Sustainability Forum. Other, Recognition Award, State. (2016).

Licensures and Certifications

Certification

Certified Wildlife Biologist, The Wildlife Society. (March 2007 - October 13, 2017).

Licensure

Drug Enforcement Agency, Number: RC0376221, U.S. Dept. of Justice, KY, United States. (September 2008 - August 2018).

Dr. Larry J. Grabau

College of Agriculture, Food and Environment
Department of Plant and Soil Sciences
2016-2021 CV for Annual Performance Review

Research and Scholarship

Sponsored Projects

Closed

Hollingsworth R., Deffendall M., Grabau L., J., Hargrove R., A., University of Kentucky - Summer Academy - GEAR UP KY 3.0 Yr6, Sponsored by KY Council on Postsecondary Education Submitted: April 18, 2017. Funding Dates: May 1, 2017 - August 31, 2017. | Awarded: \$215,000.00

OSPA ID: 201704181341

Hollingsworth R., Butina M., L., Clark D., L. G., Deffendall M., DeVito A., Flanagan S., Grabau L., J., Guilliams C., Henry L., Hull T., Kerksmar S., E., Reynolds M., Vincent S., K., Walcott B., L., White N., M., University of Kentucky - Summer Academy - GEAR UP KY 3.0 Yr5, Sponsored by KY Council on Postsecondary Education Submitted: June 2, 2016. Funding Dates: May 1, 2016 - August 31, 2016. | Awarded: \$250,000.00

OSPA ID: 201606021058

Not Funded

Grabau L., J., Ma X., Can Teachers Help Immigrant Students Learn Science by Intentionally Working toward an Enhanced Comprehension of the Nature of Science?, Sponsored by Spencer Foundation Submitted: February 1, 2019. | Awarded: \$0.00

OSPA ID: 201902011249

Grabau L., J., Ma X., Leveraging 2015 Canadian PISA Science Epistemology to Support U.S. Immigrant Students, Sponsored by American Educational Research Association Submitted: May 19, 2019. | Awarded: \$0.00

OSPA ID: 201905191843

Perry S., E., Goodin M., M., Grabau L., J., Howe D., K., Royster D., C., Scholarships, Academic Support and Enrichment for Undergraduates in Agricultural Biotechnology, Sponsored by National Science Foundation Submitted: May 16, 2016. | Awarded: \$0.00

OSPA ID: 201605161508

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
NRE 395 - 001	1.00000 - 3.00000	1	10 Fall 2020-2021
NRE 399 - 001	1.00000 - 3.00000	2	10 Fall 2020-2021
NRE 400 - 201	2.00000 - 2.00000	7	10 Fall 2020-2021
GEN 100 - 002	3.00000 - 3.00000	16	30 Spring 2018-2019
GEN 300 - 004	1.00000 - 3.00000	3	30 Spring 2018-2019
GEN 100 - 020	3.00000 - 3.00000	17	10 Fall 2018-2019
GEN 300 - 002	1.00000 - 3.00000	25	10 Fall 2018-2019
EXP 396 - 012	1.00000 - 12.00000	2	50 Summer 2017-2018
GEN 300 - 012	1.00000 - 3.00000	1	50 Summer 2017-2018
GEN 300 - 004	1.00000 - 3.00000	7	30 Spring 2017-2018
GEN 100 - 002	3.00000 - 3.00000	26	10 Fall 2017-2018
GEN 300 - 002	1.00000 - 3.00000	29	10 Fall 2017-2018
GEN 300 - 005	1.00000 - 3.00000	10	30 Spring 2016-2017
GEN 100 - 005	3.00000 - 3.00000	25	10 Fall 2016-2017
GEN 100 - 006	3.00000 - 3.00000	23	10 Fall 2016-2017
GEN 300 - 003	1.00000 - 3.00000	15	10 Fall 2016-2017
UK 101 - 067	1.00000 - 2.00000	25	10 Fall 2016-2017
GEN 300 - 007	1.00000 - 3.00000	6	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
GEN 100 - 002	11	3.27	3.45	10 Fall 2017-2018
GEN 100 - 005	10	2.80	3.40	10 Fall 2016-2017
GEN 100 - 006	11	3.73	4.18	10 Fall 2016-2017
GEN 100 - 020	7	4.43	4.71	10 Fall 2018-2019
UK 101 - 067	12	3.83	4.25	10 Fall 2016-2017

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Dr. Christopher J. Matocha

College of Agriculture, Food and Environment
Department of Plant and Soil Sciences
2016-2021 CV for Annual Performance Review

Administrative Assignments

Chair, Natural Resources and Environmental Science Steering Committee. January 1, 2020 - Present
Responsibilities: Represents and leads the program, manages the budget, oversees curriculum with DUS and steering committee, provides all reporting to the College, and supervises staff.

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

Published

Journal Article, Academic Journal

Zhang, X., Wendroth, O. O.B., Matocha, C. J., Zhu, J., Reyes, J. (2020). Assessing field-scale variability of soil hydraulic conductivity at and near saturation, *Catena*, 187. doi: 10.1016/j.catena.2019.104335
Scopus Metric Year: 2019 | Category: Earth-Surface Processes | CiteScore: 7.1 | Highest Percentile: 97 | Rank: #/N: 4/142 | SNIP: 1.818 | SJR: 1.389

Zhang, X., Wendroth, O. O.B., Matocha, C. J., Zhu, J. (2019). Estimating Soil Hydraulic Conductivity at the Field Scale with a State-Space Approach, *Soil Science*, 184(3), 101-111. doi: 10.1097/SS.0000000000000253

Bai, X., + Huang, Y., Ren, W., Coyne, M. S., Jacinthe, P. A., Tao, B., Hui, D., Yang, J., Matocha, C. J. (2019). Responses of soil carbon sequestration to climate-smart agriculture practices: A meta-analysis, *Global Change Biology*, 25(8), 2591-2606. doi: 10.1111/gcb.14658
WOS Metric Year: 2019 | Category: ECOLOGY | JIF: 8.555 | Rank by JIF: 7/169
Scopus Metric Year: 2019 | Category: Ecology | CiteScore: 15.2 | Highest Percentile: 99 | Rank: #/N: 4/370 | SNIP: 2.593 | SJR: 4.198
Author Role:
Yang: Helped write the paper and served as PhD advisor

Zhang, X., Zhu, J., Wendroth, O. O.B., Matocha, C. J., Edwards, D. R. (2019). Effect of macroporosity on pedotransfer function estimates at the field scale, *Vadose Zone Journal*, 18(1). doi: 10.2136/vzj2018.08.0151
Scopus Metric Year: 2019 | Category: Soil Science | CiteScore: 5.5 | Highest Percentile: 82 | Rank: #/N: 22/126 | SNIP: 1.41 | SJR: 1.219

+ Elhaj Baddar, Z., Matocha, C. J., * Unrine, J. M. (2019). Surface coating effects on the sorption and dissolution of ZnO nanoparticles in soil, *Environmental Science: Nano*, 6(8), 2495-2507. doi: 10.1039/c9en00348g
WOS Metric Year: 2019 | JIF: 7.683 | TC: 3319
Scopus Metric Year: 2019 | Category: Materials Science (miscellaneous) | CiteScore: 10.5 | Highest Percentile: 99 | Rank: #/N: 1/86 | SNIP: 1.396 | SJR: 1.961

Matocha, C. J., Karathanasis, T. D., Murdock, L. W., Grove, J. H., Goodman, J., Call, D. (2018). Influence of Ryegrass on Physico-Chemical Properties of a Fragipan Soil, *Geoderma*, 317, 32-38. doi: 10.1016/j.geoderma.2017.12.004
| JIF: 3.74

* + Rienzi, E. A., Fox, J. F., Grove, J. H., Matocha, C. J. (2018). Experimental Results and Temporal Surrogate Modeling of Particulate Organic Carbon Released During Interrill Erosion, *Catena*, 163, 1-12. doi: <https://doi.org/10.1016/j.catena.2017.12.007>
| JIF: 3.256

+ Reyes, J., * Wendroth, O. O.B., Matocha, C. J., Zhu, J., Ren, W., Karathanasis, A. D. (2018). Reliably mapping clay content coregionalized with electrical conductivity, *Soil Science Society of America Journal*, 82, 578-592. doi: 10.2136/sssaj2017.09.0327
| JIF: 1.92

+ Zhou, R., Basu, K., Hartman, H., Matocha, C. J., Sears, S. K., Vali, H., * Guzman, M. I. (2017). Catalyzed Synthesis of Zinc Clays by Prebiotic Central Metabolites, *SCIENTIFIC REPORTS*, 7. doi: 10.1038/s41598-017-00558-1
| JIF: 4.259

Matocha, C. J., Grove, J. H., Karathanasis, T. D., Vandiviere, M. (2016). Changes in Soil Mineralogy Due to Nitrogen Fertilization in an Agroecosystem, *Geoderma*, 263, 176-184. doi: 10.1016/j.geoderma.2015.09.002
| JIF: 4.036

Correction

Zhou, R., Basu, K., Hartman, H., Matocha, C. J., Sears, S. K., Vali, H., Guzman, M. I. (2017). Catalyzed Synthesis of Zinc Clays by Prebiotic Central Metabolites (vol 7, 533, 2017), *SCIENTIFIC REPORTS*, 7. doi: 10.1038/s41598-017-04859-3
| JIF: 4.259

Sponsored Projects

Awarded

Matocha C., J., Coyne M., S., The Role of the Mineralosphere in Dictating the Fate of Ammonium in Soils, Sponsored by National Institute of Food and Agriculture Submitted: July 29, 2019. Funding Dates: June 1, 2020 - May 31, 2023. | Awarded: \$439,757.00
OSPA ID: 201907291347

Closed

Murdock L., W., Grove J., H., Matocha C., J., Corn Fragipan, Sponsored by Kentucky Corn

Growers Association Submitted: July 21, 2015. Funding Dates: August 1, 2015 - December 31, 2017. | Awarded: \$25,000.00

OSPA ID: 201507211143

Murdock L., W., Karathanasis A., D., Matocha C., J., Fragipan Remediation Soybean, Sponsored by Kentucky Soybean Promotion Board Submitted: February 4, 2014. Funding Dates: April 1, 2014 - March 31, 2017. | Awarded: \$35,000.00

OSPA ID: 201402040929

Not Funded

Shepard C., Epps R., B., Lau D., L., Lee B., D., Matocha C., J., McNear D., H., Creating a Physical and Virtual Three-Dimensional Soil Monolith Collection for Education and Training., Sponsored by Natural Resources Conservation Service Submitted: June 25, 2019. | Awarded: \$0.00

OSPA ID: 201906252137

Matocha C., J., Grove J., H., Dynamics of Ammonium Fertilizer Transformations in Clay Fractions and Bulk Soils from a No-Tillage Agroecosystem, Sponsored by National Institute of Food and Agriculture Submitted: July 30, 2018. | Awarded: \$0.00

OSPA ID: 201807300855

Matocha C., J., Grove J., H., Dynamics of Nitrogen Transformations in a No-till Agroecosystem, Sponsored by National Institute of Food and Agriculture Submitted: June 21, 2017. | Awarded: \$0.00

OSPA ID: 201706211058

Martin A., D'Angelo E., M., Hower J., C., Matocha C., J., Unrine J., M., RARE-1 Microbial Ecology of Selenium Oxyanion Removal and Pollution, Sponsored by National Science Foundation Submitted: August 24, 2018. Requested: \$300,000.00, | Awarded: \$0.00

OSPA ID: 201808241648

Scope Grants

Closed

Matocha C., J., 104B State Water Resources Research Institute Scope 16: Water and Solute Movement in a Fragipan Soil as Modified by Ryegrass, Sponsored by US Geological Survey Submitted: July 6, 2018. Funding Dates: June 18, 2018 - June 17, 2019. Requested: \$5,000.00, | Current Budget Amount: \$5,000.00

Prime Grant OSPA ID: 201601131512

Non-Sponsored Projects

College

Not Funded

Shepard, C. (Principal), Matocha, C. J. (Co-Investigator), 2019-2020 Research Activity Award for the purchase of a McCrone Mill, CAFE. Awarded: \$3000.

Description: Applied for enrichment funds to the CAFE to support the purchase of a McCrone Mill.

Department

Closed

Shepard, C. (Principal), McNear, D. H. (Co-Investigator), Matocha, C. J. (Co-Investigator), Lee, B. D. (Co-Investigator), Support for development of a soil monolith collection to enhance teaching and outreach, Plant and Soil Sciences Department, (July 1, 2019 - June 30, 2020). Awarded: \$9000.

Description: Funding to support the development of a soil monolith collection for the Soils group in the PSS Department.

Federal

On-going

Matocha, C. J. (Principal), Smith, K. P. (Co-Investigator), Water and solute movement in a Fragipan soil as modified by ryegrass, United States Geological Survey, (June 18, 2018 - June 17, 2019). Awarded: \$5000.

Description: (This grant came through after the last OSPA upload)

This grant project will study the effect of ryegrass rooting on breaking up impermeable fragipan horizons and promoting vertical movement of water and nutrients. Dr. Matocha will oversee the project, including the training of the MS student Keegan Smith. The results from this study will frame a portion of Keegan Smith's thesis.

Hatch

On-going

Matocha, C. J., Dynamics of Nitrogen Fertilizer Transformations in a No-Tillage Agroecosystem, (January 1, 2019 - December 31, 2021).

Matocha, C. J., Dynamics of Nitrogen Fertilizer Transformations in a No-Tillage Agroecosystem, National Institute of Food and Agriculture, (January 1, 2019 - December 31, 2021).

Matocha, C. J., Nitrate-Dependent Iron(II) Oxidation in Soils, National Institute of Food and Agriculture, (October 1, 2012 - September 30, 2017).

Industrial/Trade

On-going

Matocha, C. J. (Principal), Murdock, L. W. (Co-Investigator), Smith, K. P. (Grad/Prof Student), In situ effects of ryegrass on physico-chemical properties of a Fragipan soil, Oregon Ryegrass Commission, (July 28, 2017 - July 28, 2019). Awarded: \$10000.

Description: This grant will be used to investigate the impact of ryegrass root exudates on the properties of fragipan horizons. The root exudates will be followed in situ and imaging techniques will be employed to better understand the mechanism of porosity changes elicited by ryegrass in the greenhouse and lab. Dr. Matocha will oversee the project, including the training of the MS graduate student Keegan Smith. Dr. Murdock will assist in intact soil core extraction and Keegan Smith will conduct the experiments as part of his MS thesis research.

University

On-going

Unrine, J. M. (Principal), Lee, B. D. (Co-Investigator), Matocha, C. J. (Co-Investigator), McNear, D. H. (Co-Investigator), Coyne, M. S. (Co-Investigator), Acquisition of a SVDV-ICP-OES for the Plant and Soil Analysis Lab., Office of the Vice President for Research, (December 2017 - December 2018). Awarded: \$97000.

Description: Acquisition of a new optical emission spectrometer for the Plant and Soil Analysis Lab. Matching funds provided by CAFE associate dean of research and department of plant and soil sciences.

Presentations Given

Smith K. P., McNear D. H., Wendroth O. O.B., Winkler M., Vandiviere M., Matocha C. J., (November 2019). The Impact of Ryegrass on a Fragipan soil Soil Science Society of America Annual Meeting, Soil Science Society of America.

Smith K. P., Matocha C. J., (March 2019). The Impact of Root Exudates on Element Release in a Fragipan Soil KWRRI Annual Symposium, Kentucky Water Resources Research Institute Annual Symposium, Lexington, KY, United States.

Smith K. P., Wendroth O. O.B., McNear D. H., Matocha C. J., (January 2019). The Impact of Root Exudates on Element Release in a Fragipan Soil Soil Science Society of America Annual Meeting, Soil Science Society of America.

Ji W., Yeager K. M., Matocha C. J., Feagin R. A., (December 13, 2016). Short-term surface elevation variations at Matagorda Peninsula: A response produced by shrink-swell clays? American Geophysical Union, San Francisco, CA. Accepted, State.

Podium Session

Obura P., Gordon J., Ramsey R., Matocha C. J., Shepard C., (November 2020). Vertical distribution of soil carbon and its relationship with biogeochemical properties of selected arable soils formed on phosphatic limestone. Soil Science Society of America Annual Meeting, Soil Science Society of America. Accepted, National.

Murdock L. W., Karathanasis A. D., Matocha C. J., Grove J. H., (November 13, 2019). Remediating the Fragipan with an Annual Ryegrass Cover Crop 2019 ASA-CSSA-SSSA International Annual Meetings, American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, TX. Accepted, International.

Poster Session

Smith K. P., Matocha C. J., Lee B. D., Fryar A., (October 24, 2017). Fate of heavy metals and nutrients at the CATchment 2017 ASA-CSSA-SSSA International Annual Meetings, Tampa, FL. Accepted, State.

Bowen J., McGrath J. M., Goff B. M., Ritchey E. L., Matocha C. J., McNear D. H., (November 7, 2016). Assessing spatial variation of soil phosphorus critical level 2016 ASA-CSSA-SSSA Annual Meetings, Phoenix, AZ. Accepted, National.

Extension

Extension Publications & Media

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

Published

Peer-Reviewed

Extension Publication- Numbered, Original Content

- * Murdock, L. W., Karathanasis, A. D., Matocha, C. J., Grove, J. H., Call, D. (2020). AGR-250: Remediation of the Fragipan Using Annual Ryegrass Lexington, KY, *University of Kentucky Cooperative Extension Service*, 8.

Extension Presentations Summary

Field Day Presentations

October 3, 2018.

Description: Working with MS graduate student Keegan Smith, delivered presentation to farmers about the role of cover crops (ryegrass) and chemical treatments on the breaking down of fragipan horizons. | Presentations: 3 | Participants: 130.

Extension Field & Community-Based Research

Rudolph, Rachel, Lee, Brad, Matocha, Christopher. Evaluation of excess soil phosphorus and manganese toxicity in tomato. (February 2020 - Present). UK Horticulture Research Farm.

Description:

We are evaluating the toxicity thresholds for both phosphorus and manganese in tomato. We are analyzing soil, plant tissue, and tomato fruit in order to determine the sinks for P and Mn.

Lee, Brad, Matocha, Christopher, Grove, John, McCauley, Matt. Identification, Characterization and Remediation of Sodic and Saline-Sodic Soils in Western Kentucky. (November 2016 - Present). 10 McLean, Daviess. 4 participants. USDA NRCS.

Description: Sodic and saline-sodic soils are naturally occurring and common in the arid west but rare in the humid eastern United States. Through chemical processes, these soils are poorly drained, have a very high pH and high salt content, and as a result have a very low row crop productivity. We are investigating the occurrence and remediation of these soils in the the Lower Green River Watershed and evaluating how to assist Kentucky producers impacted.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
EES 741 - 001	3.00000 - 3.00000	1	30 Spring 2019-2020
NRE 400 - 001	2.00000 - 2.00000	16	30 Spring 2019-2020
PLS 366 - 001	4.00000 - 4.00000	19	30 Spring 2019-2020
PLS 366 - 002	4.00000 - 4.00000	20	30 Spring 2019-2020
PLS 366 - 003	4.00000 - 4.00000	19	30 Spring 2019-2020
PLS 366 - 004	4.00000 - 4.00000	18	30 Spring 2019-2020
PLS 366 - 005	4.00000 - 4.00000	13	30 Spring 2019-2020
PLS 741 - 001	3.00000 - 3.00000	3	30 Spring 2019-2020
PLS 366 - 001	4.00000 - 4.00000	17	30 Spring 2018-2019
PLS 366 - 002	4.00000 - 4.00000	17	30 Spring 2018-2019
PLS 366 - 003	4.00000 - 4.00000	19	30 Spring 2018-2019
PLS 366 - 004	4.00000 - 4.00000	14	30 Spring 2018-2019
PLS 366 - 005	4.00000 - 4.00000	10	30 Spring 2018-2019
PLS 599 - 001	1.00000 - 4.00000	1	30 Spring 2018-2019
PLS 671 - 001	4.00000 - 4.00000	9	10 Fall 2018-2019
EES 782 - 004	1.00000 - 3.00000	2	30 Spring 2017-2018
PLS 366 - 001	4.00000 - 4.00000	18	30 Spring 2017-2018
PLS 366 - 002	4.00000 - 4.00000	18	30 Spring 2017-2018
PLS 366 - 003	4.00000 - 4.00000	18	30 Spring 2017-2018
PLS 366 - 004	4.00000 - 4.00000	15	30 Spring 2017-2018
PLS 366 - 005	4.00000 - 4.00000	17	30 Spring 2017-2018
PLS 366 - 001	4.00000 - 4.00000	21	30 Spring 2016-2017
PLS 366 - 002	4.00000 - 4.00000	20	30 Spring 2016-2017
PLS 366 - 003	4.00000 - 4.00000	20	30 Spring 2016-2017
PLS 366 - 004	4.00000 - 4.00000	12	30 Spring 2016-2017
PLS 366 - 005	4.00000 - 4.00000	14	30 Spring 2016-2017
NRE 399 - 003	1.00000 - 6.00000	2	10 Fall 2016-2017
PLS 671 - 001	4.00000 - 4.00000	5	10 Fall 2016-2017
EES 741 - 001	3.00000 - 3.00000	3	30 Spring 2015-2016
PLS 366 - 001	4.00000 - 4.00000	15	30 Spring 2015-2016
PLS 366 - 002	4.00000 - 4.00000	15	30 Spring 2015-2016
PLS 366 - 003	4.00000 - 4.00000	14	30 Spring 2015-2016
PLS 366 - 004	4.00000 - 4.00000	7	30 Spring 2015-2016
PLS 366 - 005	4.00000 - 4.00000	14	30 Spring 2015-2016
PLS 741 - 001	3.00000 - 3.00000	5	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
PLS 366 - 001	8	4.88	5.00	30 Spring 2019-2020
PLS 366 - 001	13	4.38	4.69	30 Spring 2018-2019
PLS 366 - 001	12	4.75	4.92	30 Spring 2017-2018
PLS 366 - 001	13	4.38	4.69	30 Spring 2016-2017
PLS 366 - 001	7	3.33	3.57	30 Spring 2015-2016
PLS 366 - 002	11	4.55	4.82	30 Spring 2018-2019
PLS 366 - 002	14	4.50	4.71	30 Spring 2017-2018
PLS 366 - 002	13	4.46	5.00	30 Spring 2016-2017
PLS 366 - 002	8	2.75	3.25	30 Spring 2015-2016
PLS 366 - 003	8	4.50	4.88	30 Spring 2019-2020
PLS 366 - 003	14	4.50	5.00	30 Spring 2018-2019
PLS 366 - 003	10	4.00	4.80	30 Spring 2017-2018
PLS 366 - 003	18	4.56	4.82	30 Spring 2016-2017
PLS 366 - 003	9	3.44	3.44	30 Spring 2015-2016
PLS 366 - 004	7	4.86	4.86	30 Spring 2019-2020
PLS 366 - 004	10	4.56	4.90	30 Spring 2018-2019
PLS 366 - 004	8	3.88	4.63	30 Spring 2017-2018
PLS 366 - 004	5	4.20	4.60	30 Spring 2016-2017
PLS 366 - 004	5	3.00	3.80	30 Spring 2015-2016
PLS 366 - 005	6	4.33	4.67	30 Spring 2018-2019
PLS 366 - 005	13	4.38	4.67	30 Spring 2017-2018
PLS 366 - 005	8	4.50	4.88	30 Spring

				2016-2017
PLS 366 - 005	11	3.91	4.00	30 Spring 2015-2016
PLS 671 - 001	9	4.89	5.00	10 Fall 2018-2019

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Dissertation Committee Member

Shashika Bandara, Chemistry, Status: In-Process. (August 15, 2016 - Present).

Edward Lo, Earth and Environmental Sciences, "A source to sink analysis of the Pantanal Basin," Status: In-Process. (August 15, 2015 - Present).

Xi Zhang, Integrated Plant and Soil Science, Status: In-Process. (August 15, 2015 - February 18, 2019).

Zeinah ElHaj Baddar, Soil Science, "Engineering zinc oxide nanoparticles to be used as nanofertilizers," Status: Completed. (August 15, 2012 - July 19, 2018).

Javier Reyes, Integrated Plant and Soil Science, "Exploring spatial and temporal variability of soil and crop processes for irrigation management," Status: Completed. (August 15, 2014 - June 20, 2018).

Ruixin Zhou, Chemistry, "Semiconductor photocatalysis: Mechanisms, photocatalytic performances and lifetime of redox carriers," Status: Completed. (August 15, 2011 - July 26, 2017).

Elizabeth Pillar, Chemistry, "Mechanisms of heterogeneous oxidations at model aerosol interfaces by ozone and hydroxyl radicals," Status: Completed. (August 15, 2011 - May 9, 2017).

Master's Thesis Committee Chair

Keegan Smith, Integrated Plant and Soil Science, "The Impact of Ryegrass on Fragipan soil," Status: Completed, Expected Completion Date: May 1, 2020. (August 15, 2017 - May 1, 2020).

Master's Thesis Committee Member

Anthony Miller, Natural Resources and Environmental Science-University of Illinois, "Effects of extraction time and phosphorus speciation on soil test phosphorus (STP) in Illinois agricultural soils," Status: Completed. (August 15, 2015 - March 2, 2017).

Outside examiner

Ding Wang, AFSC. (February 22, 2019).

Directed Student Learning (excluding theses, dissertations)

Matthew Burton. Advisor. *Fate of Ammonium in a Crider Soil*. In-Process (September 2020 - Present).

Description: Conducting research in support of current NIFA grant.

Joseph Hiltenbrand. Mentor. *The Impact of Fertilizer Nitrogen Additions on Aluminum Fractions*. Completed (January 1, 2018 - May 15, 2018).

Academic Advising

2019-2020, 9 undergraduate students advised, As a steering committee member of the Natural Resources and Environmental Science (NRES) program, I regularly advise undergraduate students.

99 Academic year 2017-2018, 6 undergraduate students advised, Advise students for the NRES program.

99 Academic year 2016-2017, 6 undergraduate students advised, Served as an advisor for NRES students.

Other Credit and Non-Credit Instructional Activities

Experiential Education in Natural Resources and Environmental Science, Participants: Undergraduate Students, 3, (2020)

Description: Mentored three students in NRE 399-Internship

Guest Lecture

Introduction to Urban and Community Forestry, Participants: Undergraduate Students, 12, (September 10, 2018)

Description: Delivered a lecture on soil physical properties and their importance in urban landscapes.

Service

Department Service

Committee Chair

Search Committee for Analytical Lab Manager Staff Position, (September 10, 2018 - November 1, 2018).

Committee Member

Academic Program Steering Committee, (July 1, 2019 - Present).

Promotion and Tenure Committee, (September 1, 2016 - June 30, 2018).

Department Advisory Committee, (September 1, 2015 - June 30, 2018).

Soil Pedology Faculty Search Committee, (May 1, 2017 - September 1, 2017).

Faculty Mentor

Coordinator of Analytical Lab, (January 1, 2016 - June 30, 2018).

College Service

Committee Member

Natural Resources and Environmental Science Steering Committee, (January 1, 2012 - Present).

Plant and Soil Science Department Chair Search Committee, (July 1, 2017 - August 31, 2017).

Professional Service

Committee Member

Soil Science Society of America, Jackson Soil Chemistry and Mineralogy Award Committee, (January 1, 2020 - December 31, 2021).

Editor, Associate Editor

Soil Science Society of America Journal, (January 1, 2011 - December 31, 2016).

Reviewer, Journal Article

Manuscript Reviewer-Geoderma Journal, (September 1, 2017 - Present).

Manuscript Reviewer- Environmental Science & Technology Journal, (September 1, 2017 - Present).

Professional Development

Professional Memberships

Geochemical Society. (June 15, 2016 - Present).

Agronomy Society of America. International. (September 1, 2000 - Present).

Soil Science Society of America. International. (September 1, 2000 - Present).

Awards and Honors

Academic Leadership Academy Fellow, Bluegrass Tomorrow. Leadership, Nominated as fellow, State. (March 2020 - October 2020).

Nominated for Provost Outstanding Teaching Award, University of Kentucky. Teaching, Provost Award for Outstanding Teaching. (2019).

Dr. Dave H. McNear Jr.

College of Agriculture, Food and Environment
Department of Plant and Soil Sciences
2016-2021 CV for Annual Performance Review

Administrative Assignments

NRES Director of Undergraduate Studies. July 1, 2016 - June 30, 2018

Responsibilities: Duties of the NRES DUS include a) advocating for the program, b) building relationships with the students, c) maintaining the academic rigor of the program, d) advising for freshman, transfers, and readmits, e) creating advising notes each semester for the NRES advisers, f) meet with prospective students, g) review and approve learning contracts for internships and research experiences, h) curriculum related issues and updates, i) confirming the course schedule/catalog each semester, and finally j) serving on the college undergraduate curriculum committee. Beyond, or in addition to, my duties as the NRES DUS I also designed and wrote the student learning outcomes assessment plant for NRES and am solely responsible for collating and evaluating all the data and writing the annual SLO report.

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

Published

Book, Chapter in Scholarly Book-New

- * + Morris, J. W., McNear, D. H., Scheckel, S. G. (2018). Biogeochemistry of Nickel in Soils, Plants and the Rhizosphere *Nickel in Soils and Plants* Boca Raton, *Taylor & Francis*, 51-85.

Journal Article, Academic Journal

- * + McGrail, R. K., Van Sanford, D. A., McNear, D. H. (2020). Trait-based root phenotyping as a necessary tool for crop selection and improvement., *Agronomy*, 10(9). doi: doi:10.3390/agronomy10091328
- + Huang, Y., * Ren, W., Grove, J., Poffenbarger, H., Jacobsen, K., Tao, B., Zhu, X., McNear, D. (2020). Assessing century-scale synergistic effects of no-tillage and cover crops on soil carbon dynamics in a maize cropping system under climate change, *Agricultural and Forest Meteorology*, 291, 108090. doi: <https://doi.org/10.1016/j.agrformet.2020.108090>
WOS Metric Year: 2019 | Category: Agronomy | JIF: 4.651 | Rank by JIF: 3/90 | TC: 19597 | Rank by TC: 4/91

Author Role: Dr. Huang performed model simulations and prepared the manuscript.
Dr. Ren contributed to concept development and supervised model simulations and manuscript preparation.
Dr. Grove managed the long-term research plots.
Dr. Poffenbarger provided soil carbon data and contributed to writing.
Dr. Jacobsen contributed to greenhouse gas measurements.

Calvo, P., Zebelo, S., McNear, D. H., Kloepper, J., Fadamiro, H. (2019). Plant growth-promoting rhizobacteria induce changes in *Arabidopsis thaliana* gene expression of nitrate and ammonium uptake genes, *Journal of Plant Interactions*, 14(1), 224-231. doi: 10.1080/17429145.2019.1602887

* Guo, H., Xin, Z., Roskopf, E. N., DiGioia, F., Hong, J. C., McNear, D. H. (2018). Impacts of anaerobic soil disinfestation and chemical fumigation on soil microbial communities in field tomato production system Amsterdam, *Applied Soil Ecology*, 126, 165-173.
| JIF: 2.916

Chen, C., * Tsyusko, O. V., McNear, D. H., Judy, J., + Lewis, R. W., * Unrine, J. M. (2017). Effects of biosolids from a wastewater treatment plant receiving manufactured nanomaterials on *Medicago truncatula* and associated soil microbial communities at low nanomaterial concentrations, *Science of the Total Environment*, 609, 799-806.
| JIF: 4.61

Lewis, R. W., Unrine, J. M., Bertsch, P. M., McNear, David H., Jr. (2017). Silver engineered nanomaterials and ions elicit species-specific O₂ consumption responses in plant growth promoting rhizobacteria, *Biointerphases*, 12(5). doi: 10.1116/1.4995605
| JIF: 2.603

Rojas, X., Guo, J., Leff, J. W., McNear, David H., Jr., Fierer, N., McCulley, R. L. (2016). Infection with a Shoot-Specific Fungal Endophyte (*EpichloA* <<) Alters Tall Fescue Soil Microbial Communities, *MICROBIAL ECOLOGY*, 72(1), 197-206. doi: 10.1007/s00248-016-0750-8
| JIF: 3.63

Ding, N., Guo, H., Kupper, J. V., McNear, David H., Jr. (2016). Shoot specific fungal endophytes alter soil phosphorus (P) fractions and potential acid phosphatase activity but do not increase P uptake in tall fescue, *PLANT AND SOIL*, 401(1-2), 291-305. doi: 10.1007/s11104-015-2757-1
| JIF: 3.052

Judy, J. D., Kirby, J. K., McLaughlin, M. J., McNear, David, Jr., Bertsch, P. M. (2016). Symbiosis between nitrogen-fixing bacteria and *Medicago truncatula* is not significantly affected by silver and silver sulfide nanomaterials, *ENVIRONMENTAL POLLUTION*, 214, 731-736. doi: 10.1016/j.envpol.2016.04.078
| JIF: 5.099

Journal Article, Academic Journal

+ Lewis, R. W., Bertsch, P. M., McNear, D. H. Date Accepted: (September, 2018). Nanotoxicity of Engineered Nanomaterials (ENMs) to Environmentally Relevant Beneficial Soil Bacteria: A Critical Review. *Nanotoxicology*. doi: 10.1080/17435390.2018.1530391
| JIF: 7.913

Sponsored Projects

Awarded

Poffenbarger H., J., McNear D., H., Getting to the Root of the Matter: Linking Root Traits to Soil Health, Sponsored by National Institute of Food and Agriculture Submitted: July 30, 2018. Funding Dates: May 1, 2019 - April 30, 2023. Requested: \$499,040.00, | Awarded: \$499,040.00

Description: We are investigating the role of roots in building soil organic matter. Poffenbarger is responsible for implementing field and lab experiments to monitor the transformation of root carbon to soil organic matter; McNear is responsible for implementing a greenhouse experiment to screen corn cultivars for diverse root systems.
OSPA ID: 201807300856

McNear D., H., Grove J., H., McGrath J., M., Rhizosphere Priming Effects on Legacy Organic Phosphorus (Po) in a Winter Wheat/corn Rotation, Sponsored by National Institute of Food and Agriculture Submitted: June 10, 2015. Funding Dates: May 15, 2016 - May 14, 2021. | Awarded: \$499,400.00
OSPA ID: 201506100905

Closed

McNear D., H., Characterization of Rhizosphere Traits in Ancestral and Modern Crop Genotypes, Sponsored by Novozymes North America Incorporated Submitted: March 14, 2018. Funding Dates: August 1, 2018 - December 31, 2020. | Awarded: \$103,688.00
OSPA ID: 201803140957

Urine J., M., Bertsch P., M., Kabengi N., McNear D., H., Tsyusko O., V., Transatlantic Initiative for Nanotechnology and the Environment (TINE), Sponsored by Environmental Protection Agency Submitted: August 5, 2009. Funding Dates: July 1, 2010 - June 30, 2016. | Awarded: \$2,000,000.00
OSPA ID: 200908051541

Moe L., A., DeBolt S., McNear D., H., Plant-Microbe Communication in the Medicago Truncatula Rhizosphere: Functional Metagenomics, Biochemistry, and Community Analysis, Sponsored by National Institute of Food and Agriculture Submitted: August 23, 2010. Funding Dates: June 1, 2011 - May 31, 2016. | Awarded: \$452,000.00
OSPA ID: 201008231502

Not Funded

Shepard C., Epps R., B., Lau D., L., Lee B., D., Matocha C., J., McNear D., H., Creating a Physical and Virtual Three-Dimensional Soil Monolith Collection for Education and Training., Sponsored by Natural Resources Conservation Service Submitted: June 25, 2019. | Awarded: \$0.00
OSPA ID: 201906252137

Ren W., Ford W., McNear D., H., Integrating multi-scale data into an improved agroecosystem model to systematically evaluate regional dynamics of nutrients and water across the Ohio River basin, Sponsored by National Institute of Food and Agriculture Submitted: June 20, 2017. Requested: \$498,813.00, | Awarded: \$0.00
OSPA ID: 201706201430

Pennell K., G., Andrews R., J., Davis A., F., Escobar I., C., Ford W., McNear D., H., Ormsbee L., E., Sampson S., O., Schendel R., R., Interweaving Kentucky's Knowledge Resources for INFEWS: A Model for STEM Graduate Education, Sponsored by National Science Foundation Submitted: February 2, 2018. Requested: \$3,000,000.00, | Awarded: \$0.00
OSPA ID: 201802020954

McNear D., H., Pre-symptomatic detection of bitter pit in apple, Sponsored by Washington State University Submitted: August 4, 2016. | Awarded: \$0.00
OSPA ID: 201608040749

McNear D., H., Kim S., Ren W., Rhizosphere Processes Influencing Legacy Root Residue Decomposition and its Contribution to Phosphorus Cycling, Sponsored by National Institute of Food and Agriculture Submitted: June 19, 2017. Requested: \$499,372.00, | Awarded: \$0.00
OSPA ID: 201706191717

McNear D., H., Rhizosphere Processes Influencing Legacy Root Residue Decomposition and its Contribution to Phosphorus Cycling, Sponsored by National Institute of Food and Agriculture Submitted: July 30, 2018. | Awarded: \$0.00
OSPA ID: 201807300857

McNear D., H., Principal, Dziubla T., D., Co-Investigator, Hilt J. Zachary, Co-Investigator, Sorghum Advancement for Next-Generation Agriculture (SANGA), Sponsored by Pacific Northwest Laboratories Submitted: September 9, 2016. Requested: \$9,990,000.00, | Awarded: \$0.00
OSPA ID: 201609091341

Pending

Shepard C., McNear D., H., Tfaily M., Quantifying Interaction of Soil Phosphorus and Soil Carbon Cycling across Carbonate Lithologies and Land Use Types, Sponsored by National Science Foundation Submitted: December 9, 2020. Requested: \$998,764.00, | Awarded: \$0.00
OSPA ID: 202012091222

Non-Sponsored Projects

Department

Closed

Shepard, C. (Principal), McNear, D. H. (Co-Investigator), Matocha, C. J. (Co-Investigator), Lee, B. D. (Co-Investigator), Support for development of a soil monolith collection to enhance teaching and outreach, Plant and Soil Sciences Department, (July 1, 2019 - June 30, 2020). Awarded: \$9000.

Description: Funding to support the development of a soil monolith collection for the Soils group in the PSS Department.

Federal

Closed

McNear, D. H., Rhizosphere processes influencing decomposition of soil organic matter and its contribution to phosphorus cycling, Pacific Northwest National Lab - Environmental Molecular Sciences Laboratory, (October 1, 2017 - September 30, 2018). Awarded: \$50978. Description: (Proposal # 50047) A proposal for instrument time at the Environmental Molecular Sciences Laboratory (EMSL) at the Pacific Northwest National Laboratory (PNNL) in Richland, WA. We were awarded the following instrument time

- 750 MHz Radiological NMR Bokan (Liquids, Solids), Awarded: 504 hrs
- 750 MHz NMR Rainier (Liquids), Awarded: 504 hrs
- Mass Spectrometer: 21T FTICR, Awarded: 90 hrs

Funding amount (in-kind support) is based on the dollar amt that would be required to purchase the amount of instrument time I was awarded with this proposal. Instrument time costs were provided by Terry Law, the user program services manager for PNNL- EMSL.

McNear, D. H. (Principal), Kalcsits, L. A. (Co-Principal), Defining the mechanisms of Ca related disorders in tree fruit, Lawrence Berkeley National Lab - Advanced Light Source, (August 2016 - July 2018). Awarded: \$70830. Description: A general user proposal submitted to the Advanced Light Source (ALS) at Lawrence Berkeley National Lab (LBNL) for access to synchrotron x-ray beamline facilities (Beamline 10.3.2) in collaboration with Lee Kalcsits from Washington State University. A note about funding amount: there is the option to buy time on these beamlines by becoming a PRT member. The purchase can be > \$30K per year depending on the beamline. The other option is to do what I have done which is to compete against other researchers via a proposal driven process for time on these instruments. I have, therefore, reported the dollar amt that would be required to purchase the amount of time I was awarded with this proposal based on the \$1686.42/8hr shift estimate provided by Lawrence Berkeley National Lab, Advanced Light Source (LBNL-ALS) User Services Group leader Sue Bailey

Kalcsits, L. A. (Principal), McNear, D. H. (Co-Principal), Three-dimensional vasculature reconstruction in fruit and its relationship to bitter pit development in apples, Pacific Northwest National Lab - Environmental Molecular Sciences Laboratory, (October 2, 2017 - October 31, 2017). Awarded: \$4050. Description: A rapid access proposal (# 50016) for x-ray computed tomography instrument time at the Molecular Sciences Laboratory (EMSL) at the Pacific Northwest National Laboratory (PNNL) in Richland, WA. We were awarded 90 hours of X-ray computed tomography time.

Funding amount (in-kind support) is based on the dollar amt that would be required to purchase the amount of instrument time I was awarded with this proposal. Instrument time costs were provided by Terry Law, the user program services manager for PNNL- EMSL.

Not Funded

McNear, D. H., Understanding abiotic stress tolerance by investigating root system architecture and rhizobiome development and differentiation in metal hyperaccumulator vs. hypertolerant plants., Pacific Northwest National Lab - Environmental Molecular Sciences Laboratory. Description: A general user proposal (# 50051) submitted to Pacific Northwest National Lab

Environmental Molecular Science Laboratory (PNNL-EMSL) for instrument time in support of PhD student (Wes Morris) research on the evolution of the metal hyperaccumulating phenotype.

McNear, D. H., Deciphering mechanisms of abiotic stress tolerance by investigating rhizobiome development and differentiation in metal hyperaccumulator vs. hypertolerant plants., Pacific Northwest National Lab - Environmental Molecular Sciences Laboratory.

Description: A proposal (# 49973) submitted to the FICUS JGI-EMSL Program - The "Facilities Integrating Collaborations for User Science" (FICUS) call between DOE JGI and Environmental Molecular Science Laboratory (EMSL) represents a unique opportunity for researchers to combine the power of genomics and molecular characterization in one proposed research project.

McNear, D. H., Rhizosphere processes influencing decomposition of soil organic matter and its contribution to phosphorus cycling, Pacific Northwest National Lab - Environmental Molecular Sciences Laboratory.

Description: A proposal (# 49844) submitted to the FICUS JGI-EMSL Program - The "Facilities Integrating Collaborations for User Science" (FICUS) call between DOE JGI and Environmental Molecular Science Laboratory (EMSL) represents a unique opportunity for researchers to combine the power of genomics and molecular characterization in one proposed research project.

On-going

McNear, D. H., Rhizobiome development and differentiation in metal hyperaccumulator vs. hypertolerant plants, Lawrence Berkeley National Lab - Advanced Light Source, (August 2017 - July 2019). Awarded: \$65770.

Description: A general user proposal submitted to the Advanced Light Source (ALS) at Lawrence Berkeley National Lab (LBNL) for access to synchrotron x-ray beamline facilities (Beamline 10.3.2) for the analysis of samples in support of PhD student (Wes Morris) research. A note about funding amount: there is the option to buy time on these beamlines by becoming a PRT member. The purchase can be > \$30K per year depending on the beamline. The other option is to do what I have done which is to compete against other researchers via a proposal driven process for time on these instruments. I have, therefore, reported the dollar amt that would be required to purchase the amount of time I was awarded with this proposal based on the \$1686.42/8hr shift estimate provided by Lawrence Berkeley National Lab, Advanced Light Source (LBNL-ALS) User Services Group leader Sue Bailey

Lee, B. D. (Principal), Unrine, J. M. (Co-Investigator), Matocha, C. J. (Co-Investigator), McNear, D. H. (Co-Investigator), Coyne, M. S. (Co-Investigator), Acquisition of a Latchet Quickchem 8500 flow injection spectrophotometer for the Plant and Soil Analysis Lab, Office of the Vice President for Research, (December 2017 - December 2018). Awarded: \$99470.

Description: Acquisition of a new Latchet flow injection spectrophotometer for the Plant and Soil Analysis Lab. Matching funds provided by CAFE associate dean of research, department of plant and soil sciences, and Tracy Farmer institute for sustainability and environment.

Under Review

McNear, D. H., Rhizosphere processes influencing decomposition of soil organic matter and its contribution to phosphorus cycling, Pacific Northwest National Lab - Environmental Molecular Sciences Laboratory.
Description: A proposal (#50542) requesting additional instrument time at the Environmental Molecular Sciences Laboratory at the Pacific Northwest National Laboratory in Richland, WA in support of our phosphorus related research.

Hatch

On-going

McNear, D. H., Plant root trait-based phenotyping in support of sustainable agronomic crop production, (October 1, 2019 - September 30, 2024).

McNear, D. H., Plant root trait-based phenotyping in support of sustainable agronomic crop production, National Institute of Food and Agriculture, (October 1, 2019 - September 30, 2024).

McNear, D. H., Influence of tall fescue cultivar and endophyte genotype combinations on root system architecture, exudate composition and soil biogeochemical processes, National Institute of Food and Agriculture, (October 1, 2013 - September 30, 2018).

Industrial/Trade

On-going

McGrath, J. M. (Principal), Brown, J. (Co-Investigator), McNear, D. H. (Co-Investigator), Ritchey, E. L., Wendroth, O. O.B., Shockley, J. M. (Co-Investigator), Goff, B. M., Spargo, J., Arnall, B., Cook, R., Culman, S., Luck, J., Fulton, J., Do Critical Phosphorus Concentration Vary in Space and if so Why?, International Plant Nutrition Institute: Phosphorus Fellowship Program, (August 2016 - July 2019). Awarded: \$484175.

University

On-going

Coyne, M. S., McNear, D. H. (Co-Investigator), Soil is Art – A Large Winogradsky Column for CAFE, UK Donovan Trust, (September 20, 2020 - June 30, 2021). Awarded: \$1400.
Description: Supplies to construct a large Winogradsky column and informational items in the lobby of Ag Science Center.

Unrine, J. M. (Principal), Lee, B. D. (Co-Investigator), Matocha, C. J. (Co-Investigator), McNear, D. H. (Co-Investigator), Coyne, M. S. (Co-Investigator), Aquisition of a SVDV-ICP-OES for the Plant and Soil Analysis Lab., Office of the Vice President for Research, (December 2017 - December 2018). Awarded: \$97000.
Description: Acquisition of a new optical emission spectrometer for the Plant and Soil Analysis Lab. Matching funds provided by CAFE associate dean of research and department of plant and soil sciences.

Presentations Given

Smith K. P., McNear D. H., Wendroth O. O.B., Winkler M., Vandiviere M., Matocha C. J., (November 2019). The Impact of Ryegrass on a Fragipan soil Soil Science Society of America Annual Meeting, Soil Science Society of America.

Smith K. P., Wendroth O. O.B., McNear D. H., Matocha C. J., (January 2019). The Impact of Root Exudates on Element Release in a Fragipan Soil Soil Science Society of America Annual Meeting, Soil Science Society of America.

McNear D. H., (November 10, 2017). Getting to the root of rhizosphere processes in managed and natural ecosystems PLS Seminar, Lexington, KY, United States. Invited, University.

Invited Speaker

McNear D. H., Joshi S., (August 15, 2018). Root exudate composition and its role in rhizosphere priming and phosphorus cycling Goldschmidt 2018, MA, United States. Invited, International.

McNear D. H., (May 3, 2017). Rhizosphere Processes in Managed Agroecosystems: Are they manageable? Natural Resources Research Day, University of Missouri, MO, United States. Invited, National.

Podium Session

Rinehart B., Salmeron Cortasa M., Messina C., Lau D. L., McNear D. H., Poffenbarger H. J., (November 2020). Long-Term Selection Has Altered Maize Root Traits Relevant to Soil Carbon Storage Annual meeting, American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Phoenix, AZ, United States. Accepted, International.

McNear D. H., (March 23, 2018). Roots, why do we neglect thee so? PLS 3 min thesis, Lexington, KY, United States. Department.

Poster Session

Banet T., McNear D. H., Poffenbarger H. J., (November 2020). Management Practices and Environmental Factors Affect Soil Retention of Corn-Derived Carbon Annual meeting, American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Phoenix, AZ, United States. Accepted, International.

Moris J. W., McNear D. H., (December 13, 2018). Rhizosphere attributes and survival strategies: The potential role of the rhizosphere in Ni hyperaccumulation vs non-accumulation in serpentine adapted flora. American Geophysical Union (AGU) 2018, DC, United States. Accepted, International.

McGrail R. K., McNear D. H., (October 3, 2018). Rhizosphere priming effects on legacy organic phosphorus in a winter wheat/corn rotation system NIFA Project Directors Meeting 2018, Newark, DE, United States. National.

McNear D. H., Joshi S., (August 15, 2018). Rhizosphere processes influencing phosphorus cycling in soils with low and high P availability Goldschmidt 2018, Boston, MA, United States. Accepted, International.

Joshi S., McNear D. H., (December 30, 2017). Rhizosphere processes influencing phosphorus cycling in soils NIFA Project Directors Meeting 2017, USDA-NIFA, DC, United States. National.

Bowen J., McGrath J. M., Goff B. M., Ritchey E. L., Matocha C. J., McNear D. H., (November 7, 2016). Assessing spatial variation of soil phosphorus critical level 2016 ASA-CSSA-SSSA Annual Meetings, Phoenix, AZ. Accepted, National.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
GEN 109 - 001	1.00000 - 6.00000	11	10 Fall 2020-2021
PLS 366 - 001	4.00000 - 4.00000	12	10 Fall 2020-2021
PLS 366 - 002	4.00000 - 4.00000	12	10 Fall 2020-2021
PLS 366 - 003	4.00000 - 4.00000	11	10 Fall 2020-2021
PLS 366 - 004	4.00000 - 4.00000	11	10 Fall 2020-2021
PLS 599 - 002	1.00000 - 4.00000	1	10 Fall 2020-2021
PLS 767 - 005	2.00000 - 2.00000	1	10 Fall 2020-2021
PLS 767 - 019	2.00000 - 2.00000	1	30 Spring 2019-2020
GEN 109 - 001	1.00000 - 6.00000	9	10 Fall 2019-2020
PLS 366 - 001	4.00000 - 4.00000	8	10 Fall 2019-2020
PLS 366 - 002	4.00000 - 4.00000	13	10 Fall 2019-2020
PLS 366 - 003	4.00000 - 4.00000	8	10 Fall 2019-2020
PLS 366 - 004	4.00000 - 4.00000	5	10 Fall 2019-2020
PLS 767 - 005	2.00000 - 2.00000	1	10 Fall 2019-2020
PLS 366 - 001	4.00000 - 4.00000	10	10 Fall 2018-2019
PLS 366 - 002	4.00000 - 4.00000	14	10 Fall 2018-2019
PLS 366 - 003	4.00000 - 4.00000	15	10 Fall 2018-2019
PLS 366 - 004	4.00000 - 4.00000	8	10 Fall 2018-2019
PLS 767 - 005	2.00000 - 2.00000	1	10 Fall 2018-2019
PLS 767 - 019	2.00000 - 2.00000	1	30 Spring 2017-2018
PLS 366 - 001	4.00000 - 4.00000	10	10 Fall 2017-2018
PLS 366 - 002	4.00000 - 4.00000	13	10 Fall 2017-2018
PLS 366 - 003	4.00000 - 4.00000	14	10 Fall 2017-2018
PLS 366 - 004	4.00000 - 4.00000	12	10 Fall 2017-2018
EXP 397 - 007	1.00000 - 1.00000	1	30 Spring 2016-2017

PLS 799 - 010	1.00000 - 4.00000	1	30 Spring 2016-2017
PLS 366 - 001	4.00000 - 4.00000	11	10 Fall 2016-2017
PLS 366 - 002	4.00000 - 4.00000	15	10 Fall 2016-2017
PLS 366 - 003	4.00000 - 4.00000	13	10 Fall 2016-2017
PLS 366 - 004	4.00000 - 4.00000	13	10 Fall 2016-2017
PLS 767 - 019	2.00000 - 2.00000	1	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
GEN 109 - 001	5	4.40	4.60	10 Fall 2020-2021
PLS 366 - 001	8	4.50	4.75	10 Fall 2020-2021
PLS 366 - 001	6	4.17	4.67	10 Fall 2019-2020
PLS 366 - 001	9	3.67	4.22	10 Fall 2018-2019
PLS 366 - 001	9	4.22	4.78	10 Fall 2017-2018
PLS 366 - 001	8	4.50	4.75	10 Fall 2016-2017
PLS 366 - 002	10	4.10	4.40	10 Fall 2020-2021
PLS 366 - 002	13	3.75	4.15	10 Fall 2019-2020
PLS 366 - 002	13	3.85	4.15	10 Fall 2018-2019
PLS 366 - 002	9	4.44	4.67	10 Fall 2017-2018
PLS 366 - 002	15	4.13	4.27	10 Fall 2016-2017
PLS 366 - 003	9	4.11	4.78	10 Fall 2020-2021
PLS 366 - 003	8	4.63	4.88	10 Fall 2019-2020
PLS 366 - 003	12	3.25	3.67	10 Fall 2018-2019
PLS 366 - 003	13	4.46	4.46	10 Fall 2017-2018
PLS 366 - 003	12	3.75	4.33	10 Fall 2016-2017
PLS 366 - 004	9	4.33	4.89	10 Fall 2020-2021
PLS 366 - 004	5	4.20	4.00	10 Fall 2019-2020
PLS 366 - 004	7	4.43	4.14	10 Fall 2018-2019
PLS 366 - 004	10	4.30	4.30	10 Fall 2017-2018
PLS 366 - 004	9	4.56	4.78	10 Fall 2016-2017

Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Dissertation Committee Chair

James Morris, Integrated Plant and Soil Sciences, "Understanding abiotic stress tolerance by investigating rhizobiome development and differentiation in metal hyperaccumulator vs. hypertolerant plants.," Status: In-Process, Expected Completion Date: May 2019. (August 2016 - Present).

Rebecca McGrail, Integrated Plant and Soil Sciences, "Rhizosphere priming effects on legacy organic phosphorus (Po) in a winter wheat/corn rotation," Status: In-Process. (August 2017 - May 2021).

Ricky Lewis, Integrated Plant and Soil Sciences, "The environmental effects of manufactured nanomaterials on plant growth promoting rhizobacteria (PGPR)," Status: Completed, Paul Bertsch. (August 2012 - August 2016).

Dissertation Committee Member

Jieran Li, Integrated Plant and Soil Sciences, "Effect of CeO₂ nanoparticles on pathogen defense in crops," Status: In-Process, Expected Completion Date: December 2018. (August 2015 - Present).

Derek Law, Geography, "Does soil have a memory? Microbial community structure and transitions in forest tree throws." (August 2012 - Present).

Master's Thesis Committee Chair

Thomas Muratore, Integrated Plant and Soil Sciences, "Long-term Management Practices and Their Impact on Soil Health and Crop Productivity," Status: In-Process. (August 2017 - May 2019).

Master's Thesis Committee Member

Ben Diaz, Integrated Plant and Soil Sciences, "The role of PQQF and PQQG in biosynthesis in *Pseudomonas putida* KT2440," Status: Completed. (August 28, 2017).

Directed Student Learning (excluding theses, dissertations)

Thomas Mann. Research Supervision. . In-Process (October 2018 - Present).

Description: Works in lab in support of PhD student Rebecca McGrail's research on phenotyping wheat roots.

John Bernardo. Internship Advisor. *Microbiological Examination of Canine Fecal Coliform Growth*. In-Process (September 2018 - Present).

Description: John Bernardo worked on a research project in Dr. Mark Coyne's lab

Paige Williams. Research Supervision. . In-Process (October 2017 - Present).

Description: Works on various projects within the Rhizosphere Science Laboratory.

Jamie Fuller. Internship Advisor. *Wilderness Trace Solar - A full scale energy consumption audit.* In-Process (May 2018 - December 2018).

Description: Jamie Fuller (NRES Sophomore) carried out her NRE 399 internship with Wilderness Trace Solar during the summer of 2018.

Josh Marshal. Internship Advisor. *KY American Water Internship.* In-Process (May 2018 - December 2018).

Description: Josh Marshal (NRES Senior) carried out his NRE 399 internship with KY American Water during the summer of 2018.

Allison Eades. Internship Advisor. *The effects of fertilizer on soil, crops, and water..* In-Process (December 2017 - December 2018).

Description: Allison worked at the Regulatory Services lab testing soils and updating the publications Reg Services distributes to county extension offices.

Arianna Nouel. Internship Advisor. *Professional Horticulture and Wildlife Management Intern at Walt Disney World.* Completed (May 2018 - October 2018).

Description: Arianna worked as an intern on the ground crew for Walt Disney World Resort Park in Orlando, Florida.

Rachel Steffan. Internship Advisor. *Wildlife Management in Kuli Wildlife Reserve, Malawi.* In-Process (May 2018 - October 2018).

Description: Rachel traveled to Malawi to work on the Kuli Wildlife Reserve

Kelly Chen. Internship Advisor. *Serpentine soils and the rhizosphere of nickel hyperaccumulators: the root of novel antibiotics?.* Completed (August 2017 - August 2018).

Description: Kelly was a student at Paul Lawrence Dunbar High School and part of the Kentucky Young Researchers Program. She completed her 300 h of research in my lab on a project under my and my PhD students supervision.

Cameron Baller. Internship Advisor. *Environmental Education in Cape Town, South Africa.* Completed (May 2017 - October 2017).

Description: Cameron traveled to South Africa where he worked as an Education Intern with Beyond Expectations Environmental Project (BEEP)

Maria Morrogh-Bernard. Research Supervision. *Phytosiderophore production in various wheat cultivars.* Completed (April 29, 2015 - April 29, 2016).

Description: Visiting international student from Argentina (UBA)

Academic Advising

99 Academic year 2017-2018, 27 undergraduate students advised, 3 graduate student advised, 1 professional students advised, 2 interns and residents advised, I advised ~20-35 undergraduate students in the Natural Resources and Environmental Sciences (NRES) undergraduate program in the 2016-2017 academic year. Undergraduate advising includes meeting at a minimum 2-3 times per year to review and plan for courses for the coming semesters, discuss internship opportunities, ensure timely graduation, process course overrides and substitutions, etc. I have 3 graduate students in my lab (1 MS, 2 PhD), a postdoctoral scholar, and regularly employ 2 undergraduate students to assist with research projects. I meet with my research group biweekly and individually almost every day.

99 Academic year 2016-2017, 38 undergraduate students advised, 3 graduate student advised, 1 professional students advised, 2 interns and residents advised, I advised ~38 undergraduate students in the Natural Resources and Environmental Sciences (NRES) undergraduate program in the 2016-2017 academic year. Undergraduate advising includes meeting at a minimum 2-3 times per year to review and plan for courses for the coming semesters, discuss internship opportunities, ensure timely graduation, process course overrides and substitutions, etc. I have 3 graduate students in my lab (1 MS, 2 PhD), a postdoctoral scholar, and regularly employ 2 undergraduate students to assist with research projects. I meet with my research group biweekly and individually almost every day.

Program and Curriculum Development

2017

Program/Curriculum Name - Faculty Reviewer for PLS404 Integrated Weed Management

Description: Attended lecture and lab for PLS404 and provided feedback to instructor and department chair on teaching effectiveness.

Program/Curriculum Name - B.S. Natural Resources and Environmental Sciences

Description: Led efforts to review emphasis areas in the NRES curriculum. Included revising EA descriptions, reviewing the guided electives under each EA and adding/subtracting courses where necessary, requesting letters of support from 13 different department chairs across the University to gain departmental faculty approval for the inclusion of courses from their department as options in the NRES major. Completed the necessary paperwork for a curriculum revision and shepherded the package through the CAFE UCC, University UCC to final Senate approval.

Program/Curriculum Name - B.S. Natural Resources and Environmental Sciences

Description: Wrote the student learning outcomes assessment plan for the B.S. NRES program. Responsible for collecting artifacts to assess the student learning outcomes (SLO's) and for submitting final reports every Oct.

2018

Program/Curriculum Name - B.S. Natural Resources and Environmental Sciences

Description: Revised the student learning outcomes assessment plan for the B.S. NRES program. Responsible for collecting artifacts to assess the student learning outcomes (SLO's) and for submitting final reports every Oct.

Program/Curriculum Name - B.S. Agricultural Ecosystem Sciences

Description: Designed a new undergraduate curriculum for the Department of Plant and Soil Sciences

Other Credit and Non-Credit Instructional Activities

Guest Lecture

Scientific Method in Biotechnology, Participants: Undergraduate Students, 30, (December 6, 2018)

Description: Methods in Rhizosphere Science Research

Ecosystem Ecology, Participants: Graduate Students, 20, (October 4, 2016)

Description: Rhizosphere processes in managed agroecosystems: are they manageable?

Service

Department Service

Committee Chair

Soil Nutrient Management Faculty Search Committee, (May 2017 - January 2018).

Committee Member

Ag North Soil Testing Lab Analyst replacement search committee, (September 2018 - Present).

North Farm Steering Committee, (April 2018 - Present).

Academic Program Steering Committee, (July 27, 2017 - Present).

Laboratory Safety Committee, (July 27, 2017 - Present).

College Service

Committee Member

Students Affairs Officer III search committee, (August 1, 2017 - November 1, 2017).

Professional Service

Editor, Associate Editor

Rhizosphere Science Journal, (January 2016 - Present).

Reviewer, Grant Proposal

Canadian Light Source User Proposals, (January 2010 - Present).

Reviewer, Journal

PLOS One, (January 2010 - Present).

Soil Biology and Biochemistry, (January 2007 - Present).

Plant and Soil, (January 2007 - Present).

Professional Development

Professional Memberships

Agronomic Society of America. International. (January 1995 - Present).

Crop Science Society of America. International. (January 1995 - Present).

Soil Science Society of America. International. (January 1995 - Present).

Awards and Honors

A teacher who made a difference, University of Kentucky, College of Education. Teaching, Recognition Award, University. (April 21, 2018).

Dr. Jack K. Schieffer

College of Agriculture, Food and Environment
Department of Agricultural Economics
2016-2021 CV for Annual Performance Review

Administrative Assignments

Internship Coordinator (NRES program). 2012 - Present

Responsibilities: Oversee the NRE 399 and 395 internship and research experiences, including coordinating with faculty supervisors. Organize the annual NRES Forum event.

Research and Scholarship

Intellectual Contributions

* = Senior Author ~ = Corresponding Author + = Grad/Prof Student # = Post Doc ^ = Undergraduate

WOS = Web of Science JIF = Journal Impact Factor TC = Journal Total Cites
SNIP = Source Normalize Impact per Paper SJR = Scimago Journal Rank

Published

Book, Chapter

* Schieffer, J. (2016). Urban Water Management: Responding to Federal Regulation *Water in Kentucky: Natural History, Communities, and Conservation*, University Press of Kentucky.

Journal Article, Academic Journal

Kim, G. S., Schieffer, J., Mark, T. B. (2020). Do superfund sites affect local property values? Evidence from a spatial hedonic approach, *Economic Analysis and Policy*, 67, 15-28. doi: 10.1016/j.eap.2020.05.007

+ Zuo, N., Schieffer, J. K., Buck, S. (2019). The Effect of the Oil and Gas Boom on Schooling Decisions in the U.S., *Resource and Energy Economics*, 55, 1-23.
WOS Metric Year: 2019 | Category: Economics | JIF: 1.829 | Rank by JIF: 121/373 | TC: 2179 | Rank by TC: 112/373
Scopus Metric Year: 2019 | Category: Economics, Econometrics, and Finance: Economics and Econometrics | CiteScore: 3.9 | Highest Percentile: 83 | Rank: #/N: 104/637 | SNIP: 1.118 | SJR: 1.488
Author Role:
S. Buck contributed to *Methodology Design, Formal Analysis, Writing-original draft preparation, Writing-review and editing, and Supervision of Analysis*.

Vassalos, M., Hu, W., Woods, T. A., Schieffer, J. K., Dillon, C. R. (2016). Risk Preferences, Transaction Costs, and Choice of Marketing Contracts. Evidence from a Choice Experiment with Fresh Vegetable Producers, *Agribusiness: An International Journal*, 32(3), 379-396.

Brown, R., * Dillon, C. R., Schieffer, J. K., Shockley, J. M. (2016). The carbon footprint and economic impact of precision agriculture technology on a corn and soybean farm, *Journal of Environmental Economics and Policy*, 5(3), 335-348.

Non-Sponsored Projects

Federal

Hatch Multi-State

On-going

Schieffer, J. K., Benefits and Costs of Natural Resources Policies Affecting Ecosystem Services on Public and Private Lands, National Institute of Food and Agriculture, (December 9, 2014 - September 30, 2017).

Presentations Given

Poster Session

Kim G., Schieffer J. K., Mark T. B., (February 2016). Measuring the Impacts of the Superfund Sites in Jefferson County, Kentucky by Using a Spatial Hedonic Model Southern Agricultural Economics Association Annual Meeting, SAEA, San Antonio, TX, United States. Accepted, Regional.

Teaching

Teaching

Prefix Number - Section	Credit Hours	# Enrolled	Code Term Year
AEC 326 - 001	3.00000 - 3.00000	34	10 Fall 2020-2021
AEC 445G - 001	3.00000 - 3.00000	37	10 Fall 2020-2021
NRE 395 - 001	1.00000 - 3.00000	1	10 Fall 2020-2021
NRE 399 - 001	1.00000 - 3.00000	2	10 Fall 2020-2021
NRE 400 - 201	2.00000 - 2.00000	7	10 Fall 2020-2021
NRE 399 - 010	1.00000 - 3.00000	5	50 Summer 2019-2020
AEC 303 - 001	3.00000 - 3.00000	20	30 Spring 2019-2020
AEC 580 - 001	1.00000 - 3.00000	1	30 Spring 2019-2020
NRE 381 - 001	3.00000 - 3.00000	36	30 Spring 2019-2020
NRE 395 - 001	1.00000 - 3.00000	1	30 Spring 2019-2020
NRE 399 - 001	1.00000 - 3.00000	11	30 Spring 2019-2020
NRE 471 - 001	4.00000 - 4.00000	29	30 Spring 2019-2020
AEC 303 - 002	3.00000 - 3.00000	14	10 Fall 2019-2020
AEC 326 - 001	3.00000 - 3.00000	29	10 Fall 2019-2020
AEC 445G - 001	3.00000 - 3.00000	31	10 Fall 2019-2020

NRE 399 - 001	1.00000 - 3.00000	6	10 Fall 2019-2020
NRE 400 - 201	2.00000 - 2.00000	10	10 Fall 2019-2020
AEC 399 - 021	1.00000 - 6.00000	1	50 Summer 2018-2019
NRE 399 - 010	1.00000 - 3.00000	13	50 Summer 2018-2019
NRE 399 - 710	1.00000 - 3.00000	1	50 Summer 2018-2019
AEC 303 - 001	3.00000 - 3.00000	32	30 Spring 2018-2019
NRE 381 - 001	3.00000 - 3.00000	40	30 Spring 2018-2019
NRE 395 - 001	3.00000 - 3.00000	3	30 Spring 2018-2019
NRE 399 - 001	3.00000 - 3.00000	6	30 Spring 2018-2019
NRE 471 - 001	4.00000 - 4.00000	22	30 Spring 2018-2019
AEC 303 - 002	3.00000 - 3.00000	18	10 Fall 2018-2019
AEC 326 - 001	3.00000 - 3.00000	30	10 Fall 2018-2019
AEC 445G - 001	3.00000 - 3.00000	34	10 Fall 2018-2019
NRE 395 - 001	3.00000 - 3.00000	1	10 Fall 2018-2019
NRE 399 - 001	3.00000 - 3.00000	4	10 Fall 2018-2019
AEC 399 - 021	1.00000 - 6.00000	1	50 Summer 2017-2018
NRE 399 - 010	3.00000 - 3.00000	24	50 Summer 2017-2018
AEC 303 - 001	3.00000 - 3.00000	34	30 Spring 2017-2018
AEC 395 - 004	1.00000 - 3.00000	1	30 Spring 2017-2018
NRE 381 - 001	3.00000 - 3.00000	51	30 Spring 2017-2018
NRE 395 - 001	3.00000 - 3.00000	4	30 Spring 2017-2018
NRE 399 - 001	3.00000 - 3.00000	3	30 Spring 2017-2018
NRE 471 - 001	4.00000 - 4.00000	19	30 Spring 2017-2018
AEC 303 - 002	3.00000 - 3.00000	24	10 Fall 2017-2018
AEC 326 - 001	3.00000 - 3.00000	34	10 Fall 2017-2018
AEC 399 - 015	1.00000 - 6.00000	2	10 Fall 2017-2018
AEC 445G - 001	3.00000 - 3.00000	28	10 Fall 2017-2018
AEC 780 - 008	1.00000 - 3.00000	1	10 Fall 2017-2018
NRE 395 - 001	3.00000 - 3.00000	4	10 Fall 2017-2018
NRE 399 - 001	3.00000 - 3.00000	24	10 Fall 2017-2018
NRE 399 - 020	1.00000 - 6.00000	1	52 2nd summer 2016-2017
AEC 767 - 008	2.00000 - 2.00000	2	30 Spring 2016-2017
NRE 381 - 001	3.00000 - 3.00000	52	30 Spring 2016-2017
NRE 399 - 001	1.00000 - 6.00000	1	30 Spring 2016-2017
NRE 399 - 003	1.00000 - 6.00000	1	30 Spring 2016-2017
NRE 471 - 001	4.00000 - 4.00000	26	30 Spring 2016-2017
AEC 326 - 001	3.00000 - 3.00000	31	10 Fall 2016-2017
AEC 445G - 001	3.00000 - 3.00000	27	10 Fall 2016-2017
AEC 745 - 001	3.00000 - 3.00000	3	10 Fall 2016-2017
AEC 767 - 008	2.00000 - 2.00000	2	10 Fall 2016-2017
ECO 726 - 001	3.00000 - 3.00000	1	10 Fall 2016-2017
NRE 395 - 001	3.00000 - 3.00000	1	10 Fall 2016-2017
NRE 399 - 001	1.00000 - 6.00000	9	10 Fall 2016-2017
NRE 399 - 004	1.00000 - 6.00000	1	10 Fall 2016-2017
AEC 399 - 004	1.00000 - 6.00000	1	30 Spring 2015-2016

AEC 767 - 008	2.00000 - 2.00000	2	30 Spring 2015-2016
NRE 381 - 001	3.00000 - 3.00000	45	30 Spring 2015-2016

Teacher Course Evaluations

Prefix Number - Section	Responses	TCE Course Quality Mean	TCE Teaching Quality Mean	Code Term Year
AEC 303 - 001	5	4.80	4.80	30 Spring 2019-2020
AEC 303 - 001	5	4.80	5.00	30 Spring 2018-2019
AEC 303 - 001	17	4.53	4.71	30 Spring 2017-2018
AEC 303 - 002	7	4.71	4.71	10 Fall 2019-2020
AEC 303 - 002	8	4.63	4.75	10 Fall 2017-2018
AEC 326 - 001	8	4.38	5.00	10 Fall 2020-2021
AEC 326 - 001	11	4.82	4.73	10 Fall 2019-2020
AEC 326 - 001	14	4.50	4.64	10 Fall 2018-2019
AEC 326 - 001	16	4.19	4.44	10 Fall 2017-2018
AEC 326 - 001	11	4.55	4.73	10 Fall 2016-2017
AEC 445G - 001	7	4.43	4.86	10 Fall 2020-2021
AEC 445G - 001	9	5.00	4.89	10 Fall 2019-2020
AEC 445G - 001	18	4.33	4.67	10 Fall 2018-2019
AEC 445G - 001	9	4.89	4.89	10 Fall 2017-2018
AEC 445G - 001	10	4.70	4.70	10 Fall 2016-2017
NRE 381 - 001	16	4.69	4.88	30 Spring 2019-2020
NRE 381 - 001	19	4.95	5.00	30 Spring 2018-2019
NRE 381 - 001	22	4.48	4.68	30 Spring 2017-2018
NRE 381 - 001	27	4.41	4.56	30 Spring 2016-2017
NRE 381 - 001	17	3.35	3.59	30 Spring 2015-2016
NRE 399 - 001	7	4.57	4.17	10 Fall 2017-2018
NRE 399 - 001	5	3.60	4.00	10 Fall 2016-2017
NRE 400 - 201	5	3.40	3.80	10 Fall 2019-2020
NRE 471 - 001	10	3.80	4.38	30 Spring 2019-2020
NRE 471 - 001	5	3.60	4.40	30 Spring 2018-2019
NRE 471 - 001	9	4.11	4.67	30 Spring 2017-2018

NRE 471 - 001	9	3.89	4.56	30 Spring 2016-2017
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Note: With regards to Spring 2020 TCEs please consider the following from page 121 of the UK Playbook for Fall 2020, "It is essential that performance evaluation take into account the extenuating circumstances brought about by the disruption for faculty in all title series and the extraordinary work accomplished by faculty in response to the disruption. Academic leaders shall reiterate that TCEs should be but one indicator of effective teaching in both periodic merit reviews and tenure/promotion decisions. Evaluation of teaching must go beyond student evaluations alone."

Theses and Dissertations

Graduate Student Advisor

Ron Childress.

Zheng Liu.

Directed Student Learning (excluding theses, dissertations)

Sophie Beavin. Internship Advisor. *NRE 399 internship*. In-Process (August 2018 - Present).

Description: Supervised NRE 399 internship

Adam Bourque. Internship Advisor. *NRE 399 internship*. Completed (May 2018 - October 2018).

Description: Supervised NRE 399 internship

Alexis Apodaca. Internship Advisor. *AEC 399 internship*. Completed (May 2018 - October 2018).

Description: Supervised AEC 399 internship

Bryan Kist. Internship Advisor. *NRE 399 internship*. Completed (May 2018 - October 2018).

Description: Supervised NRE 399 internship

Isabella Norrid. Internship Advisor. *NRE 399 internship*. Completed (May 2018 - October 2018).

Description: Supervised NRE 399 internship

Jonathan Towery. Internship Advisor. *NRE 399 internship*. Completed (May 2018 - October 2018).

Description: Supervised NRE 399 internship

Sarah Atkins. Internship Advisor. *NRE 399 internship*. Completed (May 2018 - October 2018).

Description: Supervised NRE 399 internship

Daniel Truskot. Research Supervision. *AEC 395 Research*. Completed (January 2018 - April 2018).
Description: Supervised AEC 395 research

Academic Advising

10 Fall 2018-2019, 21 undergraduate students advised.

30 Spring 2017-2018, 21 undergraduate students advised.

Academic Degrees Earned

University of Kentucky
January 1, 2021 - December 31, 2021

Agricultural Econ

Buck, Steven (Assistant Professor)

BA

University Of Dayton, International/Global Studies, 2003

BS

University Of Dayton, Mathematics, General, 2003

MS

Virginia Tech, Agricultural Economics, 2006

MS

Virginia Tech, Mathematics, General, 2005

PhD

University Of California - Berkeley, Agricultural Economics, 2011

Schieffer, Jack K. (Senior Lecturer)

B.B.A.

University of Texas, Marketing, 1989

J.D.

University of Texas, 1992

M.A.

Ohio State University, Economics, 2005

M.B.A.

Southern Methodist University, 1996

Ph.D.

Ohio State University, Agricultural, Environmental, and Development Economics, 2009

Forestry and Natural Resources

Arthur, Mary A. (Professor)

BA

Colby College, Environmental Studies, 1979

MSFOR

Yale University, Forest Sciences and Biology, 1983

PHD

Cornell University, Natural Resources/Conservation, General, 1990

Barton, Christopher D. (Professor)

BS

Centre College, Physiological Psychology/Psychobiology, 1989

MS

University of Kentucky, Plant and Soil Science, 1997

PHD

University of Kentucky, Soil Science, 1999

Cox, John J. (Associate Professor)

BS

Morehead State University, Biology/Biological Sciences, General, 1995

MSFOR

Morehead State University, Biology/Biological Sciences, General, 1997

PHD

University Of Kentucky, Animal Sciences, General, 2003

Sovie, Adia (Part-Time Instructor)

BS

University of Massachusetts, Environmental Biology, 2007

MSc

University of Florida, Wildlife Ecology and Conservation, 2015

PHD

University of Florida, Forest Sciences and Biology, 2019

Landscape Architecture

Cox, Adina (Part-Time Instructor, Postdoctoral Scholar)

BS

California State Polytechnical Institute, Landscape Architecture, 1993

M. of Natural Resources

North Carolina State University, Natural Resources Conservation 2007

PHD

North Carolina State University, Environmental Design/Architecture, 2013

Plant and Soil Sci

Grabau, Larry J. (Professor)

BS

University Of Minnesota, Agronomy and Crop Science, 1979

MS

University Of Missouri Columbia Campus, Agronomy and Crop Science, 1981

PHD

University Of Missouri Columbia Campus, Agronomy and Crop Science, 1984

Matocha, Christopher J. (Associate Professor)

BS

Texas A & M University, Soil Science and Agronomy, General, 1993

MS

Texas A & M University, Soil Science and Agronomy, General, 1996

PHD

University Of Delaware, Soil Science and Agronomy, General, 2000

McNear Jr., Dave H. (Associate Professor)

BS

Pennsylvania State University, Soil Science and Agronomy, General, 1997

MS

Pennsylvania State University, Soil Science and Agronomy, General, 2001

PHD

University of Delaware, Soil Science and Agronomy, General, 2005

	A	B	C	D	E	F	G	H	I	J
1	Faculty Me	TYT_TERM	TYT_TERM	TITLE	TCE_COUR	TCE_COUR	TCE_SECTIO	NUM_RESF	TCE_Q20_I	TCE_Q21_I
2	Arthur, Ma	10 Fall	2020-2021	FOREST EC	FOR	340	1	24	3.83	3.88
3	Arthur, Ma	10 Fall	2020-2021	FOREST EC	FOR	340	2	19	4.16	4.16
4	Arthur, Ma	10 Fall	2019-2020	FOREST EC	FOR	340	1	21	4.29	4.05
5	Arthur, Ma	10 Fall	2019-2020	FOREST EC	FOR	340	2	21	4.52	4.71
6	Arthur, Ma	30 Spring	2018-2019	FOR SEM:D	FOR	770	1	7	4.43	4.43
7	Arthur, Ma	10 Fall	2018-2019	FOREST EC	FOR	340	1	24	3.74	3.83
8	Arthur, Ma	10 Fall	2018-2019	FOREST EC	FOR	340	2	23	3.91	3.87
9	Arthur, Ma	10 Fall	2018-2019	NATURAL FN	NRE	201	1	29	4.07	4.34
10	Arthur, Ma	10 Fall	2017-2018	FOREST EC	FOR	340	1	24	3.7	3.83
11	Arthur, Ma	10 Fall	2017-2018	FOREST EC	FOR	340	2	27	4.33	4.56
12	Arthur, Ma	10 Fall	2017-2018	NATURAL FN	NRE	201	1	27	3.96	4.44
13	Arthur, Ma	10 Fall	2016-2017	FOREST EC	FOR	340	1	19	4.47	4.58
14	Arthur, Ma	10 Fall	2016-2017	FOREST EC	FOR	340	2	11	4.64	4.73
15	Arthur, Ma	30 Spring	2015-2016	SENIOR PR	NRE	471	1	8	3.5	4
16	Arthur, Ma	30 Spring	2015-2016	UNIV CR: R	UK	100	3	8	3.5	3.38
17	Arthur, Ma	10 Fall	2015-2016	FOREST EC	FOR	340	1	17	3.19	3.18
18	Arthur, Ma	10 Fall	2015-2016	FOREST EC	FOR	340	2	13	3.69	3.54
19	Arthur, Ma	10 Fall	2015-2016	UNIV CR: U	UK	100	1	8	3.75	3.88
20	Arthur, Ma	10 Fall	2015-2016	UNIV CR: U	UK	100	2	10	3.3	3.3
21	Arthur, Ma	10 Fall	2015-2016	UNIV CR: U	UK	100	3	11	3.64	3.64
22	Arthur, Ma	30 Spring	2014-2015	SENIOR PR	NRE	471	1	23	3.09	3.26
23	Arthur, Ma	30 Spring	2014-2015	SP INTRO C	A&S	100	13	6	3.33	2.83
24	Arthur, Ma	10 Fall	2014-2015	FOREST EC	FOR	340	1	18	3.72	3.89
25	Arthur, Ma	10 Fall	2014-2015	FOREST EC	FOR	340	2	23	3.39	3.43
26	Arthur, Ma	30 Spring	2013-2014	FOREST FIR	FOR	355	1	11	3.27	2.91
27	Arthur, Ma	30 Spring	2013-2014	SENIOR PR	NRE	471	1	11	2.6	2.8
28	Arthur, Ma	10 Fall	2013-2014	FOREST EC	FOR	340	1	58	3.14	3.19
29	Arthur, Ma	30 Spring	2012-2013	FOREST FIR	FOR	355	1	19	3.22	3.06
30	Arthur, Ma	30 Spring	2012-2013	SPEC TOPI	NRE	390	1	25	3.75	3.79
31	Arthur, Ma	10 Fall	2012-2013	FOREST EC	FOR	340	1	44	3.3	3.2
32	Arthur, Ma	30 Spring	2011-2012	FOR SEM: F	FOR	770	2	9	3.67	3.56
33	Arthur, Ma	30 Spring	2011-2012	FOREST FIR	FOR	355	1	18	2.6	2.36
34	Arthur, Ma	10 Fall	2011-2012	FOREST EC	FOR	340	1	38	3.39	3.18
35	Arthur, Ma	10 Fall	2011-2012	SENIOR PR	NRE	471	1	30	2.87	2.67
36	Arthur, Ma	30 Spring	2010-2011	FOR SEM: F	FOR	770	2	12	3.64	3.91
37	Arthur, Ma	10 Fall	2010-2011	FOREST EC	FOR	340	2	29	3.5	3.64
38	Arthur, Ma	30 Spring	2009-2010	FOR SEM:F	FOR	770	2	8	3.63	3.75
39	Arthur, Ma	10 Fall	2009-2010	FOREST EC	FOR	340	1	30	3.41	3.45
40	Barton, Ch	10 Fall	2020-2021	FOREST HY	FOR	460	1	5	3.4	4
41	Barton, Ch	10 Fall	2019-2020	FOREST HY	FOR	460	1	15	4.64	4.73
42	Barton, Ch	50 Summe	2018-2019	NATURAL FN	NRE	320	10	5	4	4.6
43	Barton, Ch	10 Fall	2018-2019	FOREST HY	FOR	460	1	9	4.67	4.78
44	Barton, Ch	30 Spring	2017-2018	FOREST SO	FOR	356	1	11	3.09	2.17
45	Barton, Ch	10 Fall	2017-2018	FOREST HY	FOR	460	1	16	3.75	3.69
46	Barton, Ch	51 1st sum	2016-2017	NATURAL FN	NRE	320	10	5	3.6	4.6

	A	B	C	D	E	F	G	H	I	J
47	Barton, Chr	10 Fall	2016-2017	FOREST HY	FOR	460	1	19	2.53	4.11
48	Barton, Chr	51 1st sum	2015-2016	NATURAL F	NRE	320	10	7	3	3.29
49	Barton, Chr	10 Fall	2015-2016	FOREST HY	FOR	460	1	21	3.38	3.61
50	Barton, Chr	30 Spring	2014-2015	LANDSCAP	FOR	356	1	8	3.63	4
51	Barton, Chr	10 Fall	2014-2015	FOREST HY	FOR	460	1	22	2.95	2.91
52	Barton, Chr	51 1st sum	2013-2014		NRE	320	10	7	3.83	3.83
53	Barton, Chr	51 1st sum	2013-2014	NATURAL F	NRE	320	10	5	3.75	3.75
54	Barton, Chr	30 Spring	2013-2014	LANDSCAP	FOR	356	1	13	3.46	3.62
55	Barton, Chr	10 Fall	2013-2014	FOREST HY	FOR	460	1	22	3.59	3.73
56	Barton, Chr	51 1st sum	2012-2013	NATURAL F	NRE	320	10	7	3.83	3.83
57	Barton, Chr	30 Spring	2012-2013	LANDSCAP	FOR	356	1	20	3.95	3.95
58	Barton, Chr	10 Fall	2012-2013	FOREST HY	FOR	460	1	23	3.78	3.78
59	Barton, Chr	30 Spring	2011-2012	LANDSCAP	FOR	356	1	16	3.87	3.93
60	Barton, Chr	10 Fall	2011-2012	FOREST W	FOR	460G	1	20	3.55	3.7
61	Barton, Chr	51 1st sum	2010-2011	NATURAL F	NRE	320	10	19	3.89	3.95
62	Barton, Chr	10 Fall	2010-2011	DATA COLL	NRC	320	1	10	3.9	3.9
63	Barton, Chr	10 Fall	2010-2011	FOREST W	FOR	460G	2	13	3.38	3.31
64	Barton, Chr	10 Fall	2009-2010	FOREST W	FOR	460G	1	17	3.47	3.65
65	Buck, Steve	30 Spring	2019-2020	INTRO RES	AEC	445G	1	14	4.86	4.64
66	Buck, Steve	30 Spring	2018-2019	INTRO RES	AEC	445G	1	20	2.95	3.65
67	Buck, Steve	10 Fall	2018-2019	APPLIED E	AEC	724	1	6	4.67	4.67
68	Buck, Steve	30 Spring	2017-2018	INTRO RES	AEC	445G	1	24	2.74	3
69	Buck, Steve	30 Spring	2016-2017	INTRO RES	AEC	445G	1	19	2.63	2.84
70	Buck, Steve	30 Spring	2015-2016	INTRO RES	AEC	445G	1	16	3.19	3.25
71	Cox, John J	30 Spring	2019-2020	CONSERVA	FOR	435	1	9	4.44	4.56
72	Cox, John J	30 Spring	2019-2020	CONSERVA	FOR	435	2	22	4.18	4.32
73	Cox, John J	30 Spring	2019-2020	INTRO WIL	FOR	101	1	9	4.56	4.56
74	Cox, John J	30 Spring	2018-2019	CONSERVA	FOR	435	1	21	4	4.43
75	Cox, John J	30 Spring	2018-2019	CONSERVA	FOR	435	2	20	3.8	4.05
76	Cox, John J	30 Spring	2018-2019	INTRO WIL	FOR	101	1	21	4.52	4.57
77	Cox, John J	30 Spring	2017-2018	CONSERVA	FOR	435	1	27	3.85	4.27
78	Cox, John J	30 Spring	2017-2018	WILDLIFE A	FOR	365	1	11	3.82	4.18
79	Cox, John J	10 Fall	2017-2018	INTRO WIL	FOR	101	1	14	4.57	4.71
80	Cox, John J	30 Spring	2016-2017	CONSERVA	FOR	435	1	20	3.75	3.9
81	Cox, John J	10 Fall	2016-2017	FOR SEM:V	FOR	770	2	5	3.4	4
82	Cox, John J	10 Fall	2016-2017	INTRO WIL	FOR	101	1	5	5	4.8
83	Cox, John J	10 Fall	2015-2016	CONSERVA	FOR	230	1	27	3.19	3.52
84	Cox, John J	10 Fall	2015-2016	INTRO WIL	FOR	101	1	5	3.4	3.4
85	Cox, John J	30 Spring	2014-2015	LANDSCAP	FOR	356	1	8	3.63	3.88
86	Cox, John J	10 Fall	2014-2015	CONSERVA	FOR	230	1	45	3.66	3.66
87	Cox, John J	10 Fall	2014-2015	FOR SEM:E	FOR	770	3	7	3.43	3.71
88	Cox, John J	10 Fall	2014-2015	INTRO WIL	FOR	101	1	8	3.63	3.88
89	Cox, John J	30 Spring	2013-2014	LANDSCAP	FOR	356	1	13	3.46	3.62
90	Cox, John J	10 Fall	2013-2014	CONSERVA	FOR	230	1	53	3.58	3.58
91	Cox, John J	30 Spring	2012-2013	LANDSCAP	FOR	356	1	20	3.8	3.9
92	Cox, John J	10 Fall	2012-2013	CONSERVA	FOR	230	1	50	3.14	3.2

	A	B	C	D	E	F	G	H	I	J
93	Cox, John J	10 Fall	2012-2013	FORESTRY	FOR	770	2	6	4	4
94	Cox, John J	30 Spring	2011-2012	FOR SEM: E	FOR	770	3	7	4	4
95	Cox, John J	30 Spring	2011-2012	INDEPENDI	FOR	599	2	6	4	4
96	Cox, John J	30 Spring	2011-2012	LANDSCAP	FOR	356	1	16	3.79	3.93
97	Cox, John J	10 Fall	2011-2012	CONSERVA	FOR	230	1	47	3.4	3.45
98	Cox, John J	10 Fall	2011-2012	FOR SEM: \	FOR	770	3	7	4	4
99	Cox, John J	10 Fall	2010-2011	CONSERVA	FOR	230	1	25	2.6	2.52
100	Cox, John J	10 Fall	2010-2011	FOR SEM: \	FOR	770	2	6	4	4
101	Cox, John J	30 Spring	2009-2010	CONSERVA	FOR	315	1	31	3.19	3.32
102	Cox, John J	30 Spring	2008-2009	CONSERVA	FOR	315	1	33	3.13	
103	Grabau, La	10 Fall	2018-2019	ISSUES IN A	GEN	100	20	7	4.43	4.71
104	Grabau, La	10 Fall	2017-2018	ISSUES IN A	GEN	100	2	11	3.27	3.45
105	Grabau, La	10 Fall	2016-2017	ACADEMIC	UK	101	67	12	3.83	4.25
106	Grabau, La	10 Fall	2016-2017	ISSUES IN A	GEN	100	5	10	2.8	3.4
107	Grabau, La	10 Fall	2016-2017	ISSUES IN A	GEN	100	6	11	3.73	4.18
108	Grabau, La	10 Fall	2015-2016	ISSUES IN A	GEN	100	5	11	2.64	2.55
109	Grabau, La	10 Fall	2015-2016	ISSUES IN A	GEN	100	9	12	2.25	2.08
110	Grabau, La	10 Fall	2014-2015	ISSUES IN A	GEN	100	5	14	2.83	2.25
111	Grabau, La	10 Fall	2014-2015	ISSUES IN A	GEN	100	9	17	2.81	2.94
112	Grabau, La	30 Spring	2013-2014	HONORS S	HON	251	3	13	2.58	2.83
113	Grabau, La	10 Fall	2013-2014	ISSUES IN A	GEN	100	9	21	3	3.24
114	Grabau, La	10 Fall	2011-2012	ISSUES IN A	GEN	100	9	20	3.15	3.63
115	Grabau, La	10 Fall	2010-2011	NATURAL F	NRC	301	1	36	3.56	3.69
116	Grabau, La	10 Fall	2010-2011	SENIOR PR	NRC	471	1	11	3.45	3.36
117	Grabau, La	10 Fall	2009-2010	NATURAL F	NRC	301	1	33	3.42	3.58
118	Grabau, La	10 Fall	2009-2010	SENIOR PR	NRC	471	1	8	3.75	3.75
119	Grabau, La	30 Spring	2008-2009	FUNDAMEI	PLS	366	1	31	3.61	
120	Grabau, La	30 Spring	2008-2009	TEACHING	GS	620	1	10	3.2	
121	Matocha, C	30 Spring	2019-2020	FUNDAMEI	PLS	366	1	8	4.88	5
122	Matocha, C	30 Spring	2019-2020	FUNDAMEI	PLS	366	3	8	4.5	4.88
123	Matocha, C	30 Spring	2019-2020	FUNDAMEI	PLS	366	4	7	4.86	4.86
124	Matocha, C	30 Spring	2018-2019	FUNDAMEI	PLS	366	1	13	4.38	4.69
125	Matocha, C	30 Spring	2018-2019	FUNDAMEI	PLS	366	2	11	4.55	4.82
126	Matocha, C	30 Spring	2018-2019	FUNDAMEI	PLS	366	3	14	4.5	5
127	Matocha, C	30 Spring	2018-2019	FUNDAMEI	PLS	366	4	10	4.56	4.9
128	Matocha, C	30 Spring	2018-2019	FUNDAMEI	PLS	366	5	6	4.33	4.67
129	Matocha, C	10 Fall	2018-2019	SOIL CHEM	PLS	671	1	9	4.89	5
130	Matocha, C	30 Spring	2017-2018	FUNDAMEI	PLS	366	1	12	4.75	4.92
131	Matocha, C	30 Spring	2017-2018	FUNDAMEI	PLS	366	2	14	4.5	4.71
132	Matocha, C	30 Spring	2017-2018	FUNDAMEI	PLS	366	3	10	4	4.8
133	Matocha, C	30 Spring	2017-2018	FUNDAMEI	PLS	366	4	8	3.88	4.63
134	Matocha, C	30 Spring	2017-2018	FUNDAMEI	PLS	366	5	13	4.38	4.67
135	Matocha, C	30 Spring	2016-2017	FUNDAMEI	PLS	366	1	13	4.38	4.69
136	Matocha, C	30 Spring	2016-2017	FUNDAMEI	PLS	366	2	13	4.46	5
137	Matocha, C	30 Spring	2016-2017	FUNDAMEI	PLS	366	3	18	4.56	4.82
138	Matocha, C	30 Spring	2016-2017	FUNDAMEI	PLS	366	4	5	4.2	4.6

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139	Matocha, C	30 Spring	2016-2017	FUNDAMEI	PLS	366	5	8	4.5	4.88
140	Matocha, C	30 Spring	2015-2016	FUNDAMEI	PLS	366	1	7	3.33	3.57
141	Matocha, C	30 Spring	2015-2016	FUNDAMEI	PLS	366	2	8	2.75	3.25
142	Matocha, C	30 Spring	2015-2016	FUNDAMEI	PLS	366	3	9	3.44	3.44
143	Matocha, C	30 Spring	2015-2016	FUNDAMEI	PLS	366	4	5	3	3.8
144	Matocha, C	30 Spring	2015-2016	FUNDAMEI	PLS	366	5	11	3.91	4
145	Matocha, C	30 Spring	2014-2015	FUNDAMEI	PLS	366	1	11	3.64	3.73
146	Matocha, C	30 Spring	2014-2015	FUNDAMEI	PLS	366	2	10	3.6	3.7
147	Matocha, C	30 Spring	2014-2015	FUNDAMEI	PLS	366	3	9	3.33	3.56
148	Matocha, C	30 Spring	2014-2015	FUNDAMEI	PLS	366	4	7	3.29	3.57
149	Matocha, C	30 Spring	2014-2015	FUNDAMEI	PLS	366	5	12	3.33	3.58
150	Matocha, C	10 Fall	2014-2015	SOIL CHEM	PLS	671	1	10	3.9	3.9
151	Matocha, C	30 Spring	2013-2014	FUNDAMEI	PLS	366	1	10	3.1	3.5
152	Matocha, C	30 Spring	2013-2014	FUNDAMEI	PLS	366	2	6	3	3.33
153	Matocha, C	30 Spring	2013-2014	FUNDAMEI	PLS	366	3	13	3.31	3.62
154	Matocha, C	30 Spring	2013-2014	FUNDAMEI	PLS	366	4	8	3.38	3.5
155	Matocha, C	30 Spring	2013-2014	FUNDAMEI	PLS	366	5	8	3.63	3.63
156	Matocha, C	30 Spring	2012-2013	FUNDAMEI	PLS	366	1	56	3.65	3.83
157	Matocha, C	10 Fall	2012-2013	SOIL CHEM	PLS	671	1	6	3.5	3.67
158	Matocha, C	30 Spring	2011-2012	CLAY MINE	PLS	741	1	8	4	3.75
159	Matocha, C	30 Spring	2011-2012	FUNDAMEI	PLS	366	1	26	3.27	3.69
160	Matocha, C	30 Spring	2011-2012	FUNDAMEI	PLS	366	2	11	3.64	4
161	Matocha, C	30 Spring	2011-2012	FUNDAMEI	PLS	366	3	17	3.38	3.63
162	Matocha, C	30 Spring	2011-2012	FUNDAMEI	PLS	366	4	7	2.86	3.57
163	Matocha, C	30 Spring	2011-2012	FUNDAMEI	PLS	366	5	13	3.69	3.85
164	Matocha, C	30 Spring	2010-2011	FUNDAMEI	PLS	366	1	38	3.6	3.82
165	Matocha, C	10 Fall	2010-2011	ISSUES IN A	GEN	100	8	19	3.26	3.58
166	Matocha, C	10 Fall	2010-2011	SOIL CHEM	PLS	671	1	15	3.79	3.86
167	Matocha, C	30 Spring	2009-2010	CLAY MINE	PLS	741	1	7	3.57	3.5
168	Matocha, C	30 Spring	2009-2010	FUNDAMEI	PLS	366	1	62	3.37	3.59
169	Matocha, C	10 Fall	2009-2010	ISSUES IN A	GEN	100	9	8	2.88	3.13
170	McNear, D	10 Fall	2020-2021	FUNDAMEI	PLS	366	1	8	4.5	4.75
171	McNear, D	10 Fall	2020-2021	FUNDAMEI	PLS	366	2	10	4.1	4.4
172	McNear, D	10 Fall	2020-2021	FUNDAMEI	PLS	366	3	9	4.11	4.78
173	McNear, D	10 Fall	2020-2021	FUNDAMEI	PLS	366	4	9	4.33	4.89
174	McNear, D	10 Fall	2020-2021	SPEC INTRC	GEN	109	1	5	4.4	4.6
175	McNear, D	10 Fall	2019-2020	FUNDAMEI	PLS	366	1	6	4.17	4.67
176	McNear, D	10 Fall	2019-2020	FUNDAMEI	PLS	366	2	13	3.75	4.15
177	McNear, D	10 Fall	2019-2020	FUNDAMEI	PLS	366	3	8	4.63	4.88
178	McNear, D	10 Fall	2019-2020	FUNDAMEI	PLS	366	4	5	4.2	4
179	McNear, D	10 Fall	2018-2019	FUNDAMEI	PLS	366	1	9	3.67	4.22
180	McNear, D	10 Fall	2018-2019	FUNDAMEI	PLS	366	2	13	3.85	4.15
181	McNear, D	10 Fall	2018-2019	FUNDAMEI	PLS	366	3	12	3.25	3.67
182	McNear, D	10 Fall	2018-2019	FUNDAMEI	PLS	366	4	7	4.43	4.14
183	McNear, D	10 Fall	2017-2018	FUNDAMEI	PLS	366	1	9	4.22	4.78
184	McNear, D	10 Fall	2017-2018	FUNDAMEI	PLS	366	2	9	4.44	4.67

	A	B	C	D	E	F	G	H	I	J
185	McNear, D	10 Fall	2017-2018	FUNDAMEI	PLS	366	3	13	4.46	4.46
186	McNear, D	10 Fall	2017-2018	FUNDAMEI	PLS	366	4	10	4.3	4.3
187	McNear, D	10 Fall	2016-2017	FUNDAMEI	PLS	366	1	8	4.5	4.75
188	McNear, D	10 Fall	2016-2017	FUNDAMEI	PLS	366	2	15	4.13	4.27
189	McNear, D	10 Fall	2016-2017	FUNDAMEI	PLS	366	3	12	3.75	4.33
190	McNear, D	10 Fall	2016-2017	FUNDAMEI	PLS	366	4	9	4.56	4.78
191	McNear, D	10 Fall	2015-2016	FUNDAMEI	PLS	366	1	7	3.86	4
192	McNear, D	10 Fall	2015-2016	FUNDAMEI	PLS	366	2	9	3.33	3.78
193	McNear, D	10 Fall	2015-2016	FUNDAMEI	PLS	366	3	10	3.4	3.7
194	McNear, D	10 Fall	2015-2016	FUNDAMEI	PLS	366	4	6	3.5	3.67
195	McNear, D	10 Fall	2014-2015	FUNDAMEI	PLS	366	1	12	3.42	3.83
196	McNear, D	10 Fall	2014-2015	FUNDAMEI	PLS	366	2	12	3.58	3.92
197	McNear, D	10 Fall	2014-2015	FUNDAMEI	PLS	366	3	14	3.79	3.93
198	McNear, D	10 Fall	2014-2015	FUNDAMEI	PLS	366	4	11	3.55	3.73
199	McNear, D	10 Fall	2013-2014	FUNDAMEI	PLS	366	1	42	3.4	3.62
200	McNear, D	10 Fall	2012-2013	FUNDAMEI	PLS	366	1	47	3.51	3.66
201	McNear, D	10 Fall	2011-2012	FUNDAMEI	PLS	366	1	49	3.36	3.72
202	McNear, D	10 Fall	2010-2011	FUNDAMEI	PLS	366	4	40	3.6	3.9
203	McNear, D	10 Fall	2009-2010	FUNDAMEI	PLS	366	1	39	3.43	3.7
204	Schieffer, J	10 Fall	2020-2021	INTRO RES	AEC	445G	1	7	4.43	4.86
205	Schieffer, J	10 Fall	2020-2021	PRIN ENVIF	AEC	326	1	8	4.38	5
206	Schieffer, J	30 Spring	2019-2020	MICROECO	AEC	303	1	5	4.8	4.8
207	Schieffer, J	30 Spring	2019-2020	NAT RESOL	NRE	381	1	16	4.69	4.88
208	Schieffer, J	30 Spring	2019-2020	SENIOR PR	NRE	471	1	10	3.8	4.38
209	Schieffer, J	10 Fall	2019-2020	INTRO RES	AEC	445G	1	9	5	4.89
210	Schieffer, J	10 Fall	2019-2020	MICROECO	AEC	303	2	7	4.71	4.71
211	Schieffer, J	10 Fall	2019-2020	PRIN ENVIF	AEC	326	1	11	4.82	4.73
212	Schieffer, J	10 Fall	2019-2020	PROF. NRE	NRE	400	201	5	3.4	3.8
213	Schieffer, J	30 Spring	2018-2019	MICROECO	AEC	303	1	5	4.8	5
214	Schieffer, J	30 Spring	2018-2019	NAT RESOL	NRE	381	1	19	4.95	5
215	Schieffer, J	30 Spring	2018-2019	SENIOR PR	NRE	471	1	5	3.6	4.4
216	Schieffer, J	10 Fall	2018-2019	INTRO RES	AEC	445G	1	18	4.33	4.67
217	Schieffer, J	10 Fall	2018-2019	PRIN ENVIF	AEC	326	1	14	4.5	4.64
218	Schieffer, J	30 Spring	2017-2018	MICROECO	AEC	303	1	17	4.53	4.71
219	Schieffer, J	30 Spring	2017-2018	NAT RESOL	NRE	381	1	22	4.48	4.68
220	Schieffer, J	30 Spring	2017-2018	SENIOR PR	NRE	471	1	9	4.11	4.67
221	Schieffer, J	10 Fall	2017-2018	EXP ED IN	NRE	399	1	7	4.57	4.17
222	Schieffer, J	10 Fall	2017-2018	INTRO RES	AEC	445G	1	9	4.89	4.89
223	Schieffer, J	10 Fall	2017-2018	MICROECO	AEC	303	2	8	4.63	4.75
224	Schieffer, J	10 Fall	2017-2018	PRIN ENVIF	AEC	326	1	16	4.19	4.44
225	Schieffer, J	30 Spring	2016-2017	NAT RESOL	NRE	381	1	27	4.41	4.56
226	Schieffer, J	30 Spring	2016-2017	SENIOR PR	NRE	471	1	9	3.89	4.56
227	Schieffer, J	10 Fall	2016-2017	EXP ED IN	NRE	399	1	5	3.6	4
228	Schieffer, J	10 Fall	2016-2017	INTRO RES	AEC	445G	1	10	4.7	4.7
229	Schieffer, J	10 Fall	2016-2017	PRIN ENVIF	AEC	326	1	11	4.55	4.73
230	Schieffer, J	30 Spring	2015-2016	NAT RESOL	NRE	381	1	17	3.35	3.59

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231	Schieffer, J	10 Fall	2015-2016	INTRO RES	AEC	445G	1	12	3.58	3.83
232	Schieffer, J	10 Fall	2015-2016	PRIN ENVIF	AEC	326	1	12	3.73	3.91
233	Schieffer, J	10 Fall	2014-2015	INTRO RES	AEC	445G	1	17	3.19	3.38
234	Schieffer, J	10 Fall	2014-2015	PRIN ENVIF	AEC	326	1	15	3.27	3.13
235	Schieffer, J	10 Fall	2013-2014	INTRO RES	AEC	445G	1	20	3.45	3.5
236	Schieffer, J	10 Fall	2013-2014	PRIN ENVIF	AEC	424	1	18	3.61	3.72
237	Schieffer, J	10 Fall	2012-2013	INTRO RES	AEC	445G	1	18	3.61	3.89
238	Schieffer, J	10 Fall	2012-2013	PRIN ENVIF	AEC	424	1	25	3.64	3.84
239	Schieffer, J	10 Fall	2011-2012	INTRO RES	AEC	445G	1	17	3.47	3.65
240	Schieffer, J	10 Fall	2011-2012	PRIN ENVIF	AEC	424	1	24	3.46	3.63
241	Schieffer, J	10 Fall	2010-2011	INTRO RES	AEC	445G	1	18	3.11	3.56
242	Schieffer, J	10 Fall	2010-2011	PRIN ENVIF	AEC	424	1	17	3.53	3.59

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NRES Academic Coordinator Major Job Responsibilities, Revised, April 2019

Program Operation Assistance and Coordination – 30%

Coordinates NRES student services. Communicates with students and student organizations, facilitates advising and development of internships and experiential learning opportunities. Working under the direction of the NRES Steering Committee Chair (SCC), maintains and facilitates communication within the NRES program. Responsible for NRES enrollment tracking and identifying curricular and scheduling issues to SCC and Director of Undergraduate Studies (DUS) and full NRES Steering Committee (SC) as determined by SCC. Assists the SCC and DUS in conducting annual program assessment, including collection of artifacts, and support for reporting data and summarized results. Meets regularly with SCC and DUS to facilitate communications. Supports the SCC on special projects and other duties as needed, such as providing support for periodic program review.

Student Recruitment and Outreach – 25%

Collaborates with University / College Academic Administration and recruitment offices to develop, initiate, and implement a targeted undergraduate recruitment and retention program, including updating recruitment and outreach documents; assisting with on-campus visits for prospective students in conjunction with College and University efforts; tabling at selected (on and off-campus) events. Maintains the NRES online presence (website and social media) and/or similar communication strategies in conjunction with College and University efforts. Meets with prospective students to explain the program and answer questions. Provides entry-level advising for newly admitted students into the program and transitions them to faculty-based advising.

Curriculum and Academic Enrichment Support – 20%

Provides the SCC and DUS with advising materials to facilitate student-centered high quality advising. Works with the NRES Internship Coordinator in organizing, coordinating, and implementing the research experience/internship program (NRE 395 and 399) combined with the program's Graduation Composition Communication Requirement (GCCR) course (NRE 400), including organization and logistics for the annual NRES Internship Forum and maintaining up-to-date and secure records including substitutions for the program's GCCR. Communicates with students about potential research experiences and internship opportunities. May provide instructional and/or organizational support, as directed by the SCC, for other NRE courses including but not limited to NRE 201, NRE 320.720 (Costa Rica or similar), NRE 471, NRE 395, NRE 399, NRE 390/590 and other courses taught by part-time instructors (for example).

Instructor – 20%

Serves as the on-site instructor for NRE 320.001 (NRES Extended Field Experience), typically held annually at Robinson Forest. Responsibilities include budget development, scheduling of instructional units, identifying and contacting instructors for those units (the latter two often in close collaboration with a faculty member), sourcing necessary equipment and supplies, providing instructional continuity, and making sure University requirements are satisfied for this extended field-based experience. Serves as lead instructor for NRE 201, which has an overnight instructional component that is off campus and/or a local 2-day field experience.

Professional Standards, Customer Service, and Organizational Improvement – 5%

Consistently lives out the commitment to the College of Agriculture, Food and Environment tenets of excellence, competence, respect, flexibility, communication, and learning. Models and promotes excellent customer service to all internal and external constituents. Expands professional knowledge through training, classes, and seminars. Other duties as assigned.

NRES Advising Distribution

Advisor	Advisees		
	Fall 2020	Delta	Spring 2021
Arthur	11	0	11
Cox	4	1	5
Coyne	4	1	5
Lacki	1	0	1
Matocha	8	0	8
McNear	5	1	6
Moecher	2	1	3
Paratley	8	0	8
Phillips	2	1	3
Price	8	2	10
Sass	8	1	9
Shepard	8	1	9
Schieffer	3	1	4
Sovie	38	-10	28
Total	110	0	110

NRES 6 Year Self-Study FY15-FY20
Overview

NRES Support Account

1012098180

- ☛ Source of funding comes from the College of Agriculture, Food and Environment state appropriated funds
- ☛ The NRES Support Account supports Academic Coordinator salary, 2-3 PTI overloads, and NRES program needs.

NRES Support Account Summary	(See NRES Support Acct tab for financial details)
GL Code	(All)

Sum of Net Postings	Column Labels						
Row Labels	2015	2016	2017	2018	2019	2020	Grand Total
Academic Advisor Travel	(1,538.17)	(1,346.86)	(365.75)	(171.67)	(67.10)	(575.00)	(4,064.55)
Budget	67,817.00	69,402.00	70,327.00	71,599.92	72,448.92	72,448.92	424,043.76
Budget-change	3,000.00	(100.00)	1,761.66	-	(4,201.35)	16,920.00	17,380.31
Academic Advisor	(53,067.04)	(54,402.00)	(55,172.80)	(56,599.92)	(29,557.05)	(47,773.88)	(296,572.69)
PTI	(10,680.00)	(4,500.00)	(10,000.00)	(10,300.00)	(15,000.00)	(15,000.00)	(65,480.00)
Student Employee	(785.00)	(2,025.00)	(15.00)				(2,825.00)
NRES Admin Dept Exp	(1,424.12)	(1,315.86)	(760.93)	(826.07)	(1,361.23)	(1,190.39)	(6,878.60)
NRES Program Support	(2,788.49)	(3,645.55)	(5,875.90)	(2,744.12)	(1,896.29)	(3,778.13)	(20,728.48)
Grand Total	534.18	2,066.73	(101.72)	958.14	20,365.90	21,051.52	44,874.75

NRES Course Fee Account

1013206170

- ☛ Source of funds are generate from NRES courses that have course fees associate with them.
- ☛ The course fee account supports the courses for which the fees were assessed.

Account Summary (See Course Fees Acct tab for financial details)
 GL Code (All)

Sum of Net Postings	Column Labels						
Row Labels	2015	2016	2017	2018	2019	2020	Grand Total
Course Fees	7,670.00	14,292.40	16,471.60	9,986.18	13,977.18	9,438.25	71,835.61
Course Fees-returned	(50.00)	50.00	(588.90)	513.42	(4.80)	(66.37)	(146.65)
Fund Balance Return	372.92	238.14	1,428.39	3,285.10	(839.17)	(688.08)	3,797.30
BT						(2,279.00)	(2,279.00)
Student Employee	(558.23)		(711.28)		(205.59)		(1,475.10)
NRES Admin Exp	(16.74)		(27.62)	(38.82)	(18.04)	(4.66)	(105.88)
NRES Course Related Expe	(7,179.81)	(13,152.15)	(13,287.09)	(14,585.05)	(13,597.66)	(7,177.39)	(68,979.15)
Grand Total	238.14	1,428.39	3,285.10	(839.17)	(688.08)	(777.25)	2,647.13

Last Time Offered	Course	Amount	Number Enrolled	Reason for Fee
FA20	NRE 201	\$ 73	51	Field Trip
SU20	NRE320	\$ 893	4	Camp (Robinson Forest & Costa Rica)
FA20	NRE 360	\$ 50	Cancelled	Conference
SP21	NRE 420G	\$ 50	8	Field Trip
FA14	NRE455G	\$ 25	2	?
SP21	NRE471	\$ 50	17	Field Trip

Summer School Account

1012132140

- ☛ Source of funding is from net tuition revenue from NRES summer courses
- ☛ Summer School Account has supported scholarships to NRES student enrolled in NRE 320, student employees, PTI overloads, and NRES program needs.

NRES Summer School Sum (See Summer School tab for financial details)

GL Code (Multiple Items)

Sum of Net Postings Row Labels	Column Labels							Grand Total
	2015	2016	2017	2018	2019	2020		
NRES Summer School NTR	13,994.14	5,392.69	11,487.95	14,617.67	22,147.67	16,572.23	84,212.35	
NRES Fund Balance Returr	7,673.00	7,363.00	3,633.00	2,714.00	3,840.00	10,194.00	35,417.00	
NRES BT	(2,275.00)			1,000.00	(5,300.00)		(6,575.00)	
NRES Student Employee	(2,155.00)	(2,835.00)	(3,193.90)	(3,545.85)	(2,964.19)	(2,961.75)	(17,655.69)	
NRES PTI	(4,655.75)	(300.00)					(4,955.75)	
NRES Admin Exp	(865.63)	(210.00)	(2,642.52)		(226.66)	(63.10)	(4,007.91)	
NRES Program Support	(352.37)	(53.90)	(106.15)	(1,636.19)	(2,115.00)		(4,263.61)	
NRES Scholarship	(4,000.00)	(8,500.00)	(6,250.00)	(9,000.00)	(4,500.00)		(32,250.00)	
NRES Excess Responder Funds		3,007.91					3,007.91	
Grand Total	7,363.39	3,864.70	2,928.38	4,149.63	10,881.82	23,741.38	52,929.30	

Summer Courses

Semester	Offered	Enrolled
SU 15	NRE 320	12
SU 15	NRE 399	2
SU 16	NRE 320	29
SU 16	NRE 395	1
SU 17	NRE 320	38
SU 17	NRE 399	1
SU 18	NRE 320	25
SU 18	NRE 399	24
SU 19	NRE 320	22
SU 19	NRE 399	14
SU 20	NRE 320	4
SU 20	NRE 399	5

Scholarships

Year	Amount	Students
FY15	\$ 4,000	?
FY16	\$ 8,500	7
FY17	\$ 6,250	9
FY18	\$ 9,000	13
FY19	\$ 4,500	7
FY20	\$ -	COVID

College of Agriculture, Food and Environment
Natural Resources and Environmental Science
Periodic Program Review
Site Visit Agenda (updated 3/26/2021)
March 29 – April 1, 2021
Zoom links provided by email to participants

Date: March 29, 2021	
Day 1: Monday	
10:00 – 10:30 am ET	Committee test Zoom meeting
10:30 – 11:30 am ET	Meeting with College of Agriculture, Food and Environment Dean Cox and Associate Dean for Faculty Resources, Planning and Assessment Dr. Brian Lee. Committee receives their charge from Dean Cox and Dr. Lee reviews rules and procedures.
11:30am – 12:30pm ET	Break
12:30 – 2:30 pm ET	Meet Dr. Chris Matocha, Program Director and Dr. Larry Grabau, Steering Committee Representative.
2:30 – 3:00 pm ET	Committee discussion of next steps

Date: March 30, 2021	
Day 2: Tuesday	
9:30 – 10:30 am ET	Meeting with program support staff, program faculty recused
10:30 – 11:30 am ET	Meeting with program steering committee
11:30 am - 12:45 pm	Break
12:45 – 1:45 pm ET	Meeting with current program students. Program faculty recused
1:45 – 2:45 pm ET	Meeting with program faculty not serving on steering committee

Date:	March 31, 2021
Day 3:	Wednesday

12:00 – 1:00 pm ET	Meeting with leadership of collaborating academic departments
1:00 – 2:00 pm ET	Meeting with program alumni
2:00 – 2:30 pm ET	Break
2:30 – 3:30 pm ET	Meeting with industry partners
3:30 – 4:30 pm ET	Committee discussion of next steps in process

Date:	April 1, 2021
Day 4:	Thursday

9:00 – 10:00 am ET	<p>Meeting with college leadership team</p> <ul style="list-style-type: none"> Dr. Carmen Agouridis, Instruction Dr. Brian Lee, Faculty Resources, Planning and Assessment Dr. Bob Houtz, Research Dr. Laura Stephenson, Extension Dr. Orlando Chambers, Administration (facilities) Dr. Vanessa Jackson, Director of Faculty Diversity and Inclusiveness Dr. Mia Farrell, Assistant Dean and Director for Diversity <p>Note- additional college administrators may be invited to attend if available.</p>
10:00 – 11:00 am ET	Break
11:00am – 3:30pm ET	Committee working session. This meeting is at the committee's discretion and may be shortened as needed.
3:30 – 4:30 pm ET	Committee presents preliminary findings to Dean Cox and college leadership.

Review Committee

Dr. James MacLeod	Committee Chair and Director of UK Equine Science and Management Program
Dr. Larry Grabau	NRES Program DUS
Dr. Adia Sovie	NRES Program Academic Coordinator
Jean Watts	Faculty, Bluegrass Community and Technical College, Env. Sci. & Tech. Program (recently retired program director)
Dr. Steve Smutko	Faculty and Spicer Chair of Collaborative Practice, University of Wyoming Haub School of Environment and Natural Resources, Department of Agricultural Economics
Dr. Paola Ferreri	Faculty and Director of Academic Programs, Penn State University, College of Agricultural Sciences, Department of Ecosystem Science and Management
Sandra Broadus	UK Alternative Transportation Manager and alum of NRES Program
Claire Hilbrecht	Student, NRES Program

Support for Review Committee

Dr. Brian Lee
Tricia Coakley

Office Phone #
859-218-7991
859-257-7041



Natural Resources and Environmental Science Program

2021 Periodic Program Review

Review Committee remote site visit March 29 – April 1, 2021

Conducted via Video Zoom Meetings

Review Report Submitted on August 12, 2021

Dr. James MacLeod	Committee Chair, Director of UK Ag Equine Programs
Ms. Sandra Broadus	UK Alternative Transportation Manager and alum of NRES Program
Dr. Paola Ferreri	Faculty, Penn State University, College of Agricultural Sciences, Department of Ecosystem Science and Management
Dr. Larry Grabau	NRES Program Director of Undergraduate Studies
Ms. Claire Hilbrecht	NRES Program undergraduate student
Dr. Adia Sovie	NRES Program Academic Coordinator
Dr. Steve Smutko	Faculty and Spicer Chair of Collaborative Practice, University of Wyoming Haub School of Environment and Natural Resources, Department of Agricultural Economics
Ms. Jean Watts	Faculty, Bluegrass Community and Technical College, Environmental Science Technology program (recently retired program director)

Executive Summary

An interdisciplinary understanding of environmental science, management, and policy is critical for solving today's major environmental and natural resource challenges. Importantly, an awareness of these challenges on regional, national, and global levels, as well as increasing resolve to begin addressing them with urgency, is growing as direct and tangible evidence of anthropogenic climate change becomes apparent to more and more people.

The Natural Resources and Environmental Science (NRES) degree program is a highly successful interdepartmental and multidisciplinary program in the University of Kentucky's College of Agriculture, Food and Environment (CAFE) with a long and well-established record of preparing students for environmental careers. Traditional lecture and experiential course offerings with interactive and collaborative dimensions provide learning opportunities across a wide range of environmental systems and analytical skills. The most compelling strength is the people – there is a clear and genuine commitment by students, staff, and faculty to the NRES program and its future.

In accordance with university regulations, the 2021 External Review Committee assessed NRES programs, services, resources, processes, and operations. The overall objective is to provide constructive feedback highlighting strengths, challenges, and opportunities, culminating with a list of specific recommendations for enhancement.

Brief description of external review committee process

- Prior to the review, all committee members received and studied the unit's Self-study Report submitted by the NRES Program.
- The committee received their charge from Dr. Cox, Vice President for Land Grant Engagement and Dean of CAFE, and Dr. Lee, Associate Dean for Faculty Resources, Planning and Assessment, conducted listening sessions via Zoom video conference with collaborating department chairs, program faculty, staff, students, alumni, as well as partners and stakeholders who provided broad input from industry. Dates for these sessions were March 29 – April 1, 2021.
- On Thursday, April 1, the committee held virtual working sessions and drafted language about the program's strengths, challenges, and potential committee recommendations.
- Immediately following the working sessions, the committee presented draft recommendations to Dean Cox and CAFE leadership.
- The Committee Chair, Dr. James MacLeod, together with the full committee and Ms. Patricia Coakley from the Faculty Resources, Planning and Assessment office worked to prepare this report. All members of the committee have approved the final wording.

We begin this report with a brief list of program strengths, challenges, and opportunities that the committee observed through review of the self-study and listening sessions. This is followed by committee recommendations for the program to consider and act on over the upcoming six-year program review cycle.

Strengths

- NRES students are passionate and engaged.
- Faculty, staff, and students embrace opportunities for engagement with the surrounding community and stakeholders.
- The NRES Program delivers a strong intellectual foundation in environmentally focused disciplines and content areas.
- The NRES curriculum provides students with academic flexibility that enables multiple and personalized pathways to pursue the diverse array of environmentally related careers that currently exist.
- Curriculum flexibility also enables students, with proper approval, to enroll in relevant courses not listed in the NRES curriculum.
- Students value the hands-on experiential learning opportunities provided by the NRES curriculum.
- There is a solid and long-standing commitment to the program among participating faculty. Multiple faculty members indicated feeling as strongly connected to the NRES program as to their home academic department.
- Faculty dedication and commitment have been and continue to be a critical catalyst to the success of the NRES program.
- Faculty participation in the NRES program fosters interdepartmental and multidisciplinary collaborations across all dimensions of the land grant mission.
- Robinson Forest is an exceptional resource for this program and more broadly for the university's land grant mission. Students, faculty, and alumni commented on the value of this resource.

Challenges

- Infrastructure limitations (classrooms, student support, equipment, transportation) are impacting opportunities for pedagogical innovation by the faculty, as well as learning opportunities for the students.
- The current level of financial support is limiting opportunities for programmatic growth and innovation.
- Sources of NRES financial resources need to be diversified.
- The program has insufficient participation of under-represented minority students, faculty, and steering committee members.
- The ability to maintain accessibility to the hands-on summer camp in Robinson Forest and Costa Rica for students appears to be threatened as a consequence of changes to the summer tuition funding model that will limit scholarship availability.

Opportunities

- Drawing from the interdisciplinary nature of environmental sciences, there are many opportunities for NRES to lead within both CAFE and the university to meet campus, regional, and national challenges related to environmental sciences (i.e., environmental justice, DE&I, response to climate change, transition to sustainable systems, etc.).

- Decolonization of the NRES curriculum has the potential to create opportunities for leadership in these same challenges across CAFE and the university.
- The NRES program has nearly 600 alumni¹ who can provide enhanced student learning opportunities, funding support, and expanded networking opportunities across the Commonwealth and the nation.
- There are untapped resources across the potential donor base, representing both individuals and groups, who will be interested in investing in environmental solutions.
- There are opportunities for additional student recruitment efforts through the Kentucky Community & Technical College System, high schools, 4-H, etc.
- There is interest among the students to enhance urban environmental programs including the development of an urban summer camp centered on environmental sciences. This could utilize the support of the urban extension director and provide substantial future opportunities to diversify the student body.
- Codifying leadership structure and expectations has the potential to enhance synergies between NRES and participating academic departments (MOUs, Steering Committee participation, APR, credit for participation, incentivizing new collaborations).
- A lecturer position would benefit the NRES program and the participating academic departments. However, care should be taken to ensure that this does not decrease current departmental commitments to this interdisciplinary program.

¹ A recently compiled list of graduates, from all iterations of this B.S. program (AICU, NRCM, and NRES) uncovered 585 graduates from the program's inception through summer semester of 2021.

College of Agriculture, Food and Environment Strategic Plan 2015 – 2020 goals

The review committee has indicated where recommendations address goals of the CAFE Strategic Plan 2015-2020 in parentheses following the recommendation (e.g., CAFE SP Goal #). Please note that all of the NRES recommendations support CAFE Goal 5 concerning multidisciplinary collaborations.

Goal 1: Prepare highly motivated and culturally adaptive graduates who are competitive in a global economy and support societal values.

Goal 2: Build and nurture relationships with the people of the Commonwealth and across the world.

Goal 3: Recruit, develop, and retain exceptional faculty and staff who are leaders in expanding knowledge to improve the quality of life and sustainability of the human and physical environment.

Goal 4: Show CAFE commitment to diversity and inclusion to attract and retain students, staff, and faculty, and provide a culturally aware environment for successful engagement in a global society.

Goal 5: Produce innovative solutions through multidisciplinary collaborations.

Goal 6: Build state-of-the-art facilities equipped with cutting-edge technology.

Committee Recommendations

1. Encourage the active engagement and commitment of students, alumni, and stakeholders in the NRES program. (CAFE SP Goals 1 & 5)
 - a. Foster the establishment and growth of NRES-related student organizations.
 - b. Develop a student peer mentorship program (e.g., upper-class students mentoring incoming students).
 - c. Cultivate the participation and engagement of NRES students in the college Ag Ambassadors program.
 - d. Enhance recruitment efforts by utilizing college resources to attract diverse students from under-represented minority and low-income populations across and beyond the Commonwealth. Utilize program communications methods in recruitment.
 - e. Strengthen recruitment efforts for prospective students through communication and engagement strategies in the Kentucky Community & Technical College System, high schools, 4-H, youth nature center programs, etc.
2. Expand and enhance communication strategies (CAFE SP Goals 2 & 5)
 - a. Increase internal and external communication efforts, expanding specifically both electronic and social media content. This may require additional part-time staff involvement with the assistance of rotating student support.
 - b. Enable and encourage student, alumni, and stakeholder participation on communication initiatives through invited editorials, alumni profiles, networking updates, etc.
3. Expand alumni engagement and philanthropic efforts (CAFE SP Goals 2 & 5)
 - a. Rebuild and enhance the NRES alumni database.
 - b. Engage alumni and external stakeholders through an annual social event. This could align with the NRES Fall Forum for timing. Explore the potential of enabling remote participation for distant alums and stakeholders.
 - c. Utilize communications with alumni and stakeholders (i.e., newsletter, social media) to enhance awareness of programmatic initiatives and engage them in fundraising and networking opportunities.
 - d. Develop a portfolio of fundraising priorities that cover different categories of giving opportunities and a range of target dollar amounts to be raised. Work with the CAFE Office of Philanthropy to set clear and specific fundraising goals, identify prospective donors, implement campaigns, and track progress toward targets with faculty, stakeholders, and the alumni.

4. Establish a Stakeholder Advisory Board (CAFE SP Goals 2, 3, & 5)
 - a. Rebuild and enhance the stakeholders list. Compare these data to the alumni list to identify connections and define additional opportunities.
 - b. Develop a plan to establish a Stakeholder Advisory Board that includes Bylaws which clearly articulate a mission, the purpose, a structure, and member terms.
 - c. Proceed with establishing a Stakeholder Advisory Board.
5. Diversify and increase financial resources for the NRES budget (CAFE SP Goals 3 & 5)
 - a. Work with college leadership to identify, assess, and develop new and diverse funding sources to grow the program's enrichment fund. Involve alumni, stakeholders, and students.
 - b. Explore the potential of income-generating programs and initiatives such as online courses, workshops, summer camps, etc.
 - c. Develop and implement a philanthropy plan (see #3 above).
6. Enhance and implement the existing (and excellent) DE&I plan (CAFE SP Goals 4 & 5):
 - a. Create a diverse and inclusive external stakeholder advisory board.
 - b. Identify and honor inclusive voices (for example, guest lectures, recruitment, DE&I planning).
 - c. Support efforts for the inclusion of Kentucky State University faculty in academic collaborations.
 - d. Encourage student involvement in DE&I efforts and initiatives.
 - e. Invite faculty to participate in CAFE sponsored DE&I webinars/initiatives and discuss how to implement recommendations in the NRES Steering Committee.
7. Invest in infrastructure (personnel and physical facilities) (CAFE Goals 5 & 6)
 - a. Work with college leadership to identify and address facilities concerns. Priority should be given to needs that are limiting student and faculty recruitment, high impact innovations to the curriculum, and the potential of students to collaborate and build a sense of community.
 - b. Foster collaborative efforts among the existing environmentally-related undergraduate programs. In addition to the NRE 101 course suggested in recommendation 9.c. below, investigate collaborative opportunities around recruitment, curriculum development, event planning, etc.
 - c. Develop/identify resources for procurement of equipment needed for NRES instruction to eliminate the need for "borrowed" equipment from other programs.
 - d. Investigate mechanisms and opportunities for the reinvestment of resources from research funding awarded to NRES faculty co-authors.
 - e. Collaborate with leaders of other interdepartmental programs within CAFE (and across the university) to identify and clarify best practices for effective interdepartmental/multidisciplinary program administration.
8. Facilitate new input on the NRES Steering Committee (CAFE SP Goals 3 & 5)
 - a. Increase faculty recruitment and engagement on the NRES Steering Committee from departments that are not currently official MOU collaborators.

- b. Encourage the NRES Steering Committee Chair to be present and engaged at the regular (monthly) college Chairs and Directors meetings.
 - c. Formalize Steering Committee composition to demonstrate intentional inclusion of voting representatives from each field, role (faculty/staff/student), demographic, and participating university college/department. Include an Extension representative on the Steering Committee to bring urban environment perspectives.
 - d. Work with college administration to reassess the division of effort (DOE) assigned for the Steering Committee Chair role. Adjust and align the effort distribution percentage to be consistent with the expectations and responsibilities of this position. Alternatively, work with college administration, the program director, and the Steering Committee to define a leadership strategy which identifies responsible parties for program administration tasks aligned with faculty capacity and associated DOEs.
9. Continue NRES curriculum innovation efforts (CAFE SP Goals 1, 4, & 5)
- a. Increase course components that focus on DE&I, environmental justice, and climate change issues in existing classes.
 - b. Identify a mechanism to gain feedback from alumni, students, and external stakeholders concerning emerging issues in the field that should be included in the curriculum.
 - c. Consider the feasibility of a new cross listed NRE/ENS/EES 101 course, perhaps a UK-core course and collaboration between NRES, ENS, EES, SAG, etc.
 - d. Increase available information that conveys NRES curriculum flexibility during both new student orientations and on a continuing basis to matriculated students.
 - e. Consider establishing an urban summer camp that contextualizes environmental issues and field methods in ways congruent with the life experiences of underrepresented minority students and urban communities.
10. Explore opportunities to create 4+1 programs allowing NRES students to transition efficiently into educational opportunities leading to graduate degrees. Investigate the potential for academic collaborations on this idea with regional universities and colleges (Transylvania, Centre, Kentucky State University, etc.). (CAFE SP Goals 1 & 5)

Opportunities for college leadership consideration outside the purview of a single academic program.

- 1. Support further implementation of the UK Sustainability Strategic Plan through both unit- and college-level activities to find synergy and empower collaborations.
- 2. Continue to capitalize on the momentum and value that exist within multidisciplinary interdepartmental programs. With regard to the major environmental and natural resource challenges that we are all facing, UK has the potential to solidify NRES as *the* flagship academic program for environmental science, management, and policy within the Commonwealth. The university is in a position to guide this process with instruction,

research, and extension leadership, fully justifying additional NRES support and investment. Major components of a new natural resource-based economy is gaining momentum within Kentucky and accelerating the transition from extraction to sustainability in encouraging ways. Students want training in sustainability issues and there is an apparent opportunity for increased recruitment by expanding sustainability programs.

3. Develop a category or subsection within the faculty annual performance review through which active participation and contributions to any of CAFE's four current interdepartmental programs are documented and valued.
4. Identify additional opportunities to more purposefully coordinate and de-silo the multiple environmentally-focused programs that exist across the different colleges at UK with the goal of enhancing student learning opportunities, outcomes, and flexibility.
5. Interdepartmental programs clearly foster and enhance multidisciplinary collaborative efforts. For many members of the faculty (as well as students), they provide opportunities to increase academic productivity through (1) interdisciplinary research, teaching, and extension synergies, (2) the scope and flexibility to adapt nimbly to both changes and challenges within a topic area, and (3) by providing unique recruitment opportunities for faculty, staff, and students. Additional resources combined with the removal of both real and perceived barriers are needed to empower these programs and enable them to achieve their full academic potential.

UK Program Review Implementation Plan

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

College/Unit: Natural Resources and Environmental Science

Date: 11 /2021

Recommendation/ Suggestion	Source I/E/H*	Accept/ Reject**	Unit Response (resulting goal or objective)	Actions (including needed resources)	Time Line
<p>1. Encourage the active engagement and commitment of students, alumni, and stakeholders in the NRES program. (CAFE SP Goals 1 & 5)</p> <p>a. Foster the establishment and growth of NRES-related student organizations.</p> <p>b. Develop a student peer mentorship program (e.g., upper-class students mentoring incoming students).</p> <p>c. Cultivate the participation and engagement of NRES students in the college Ag Ambassadors program.</p> <p>d. Enhance recruitment efforts by utilizing college resources to attract diverse students from under-represented minority and low-income populations across and beyond the Commonwealth. Utilize program communications methods in recruitment.</p> <p>e. Strengthen recruitment efforts for prospective students through communication and engagement strategies in the Kentucky Community &</p>	E	A	<p>We concur fully with this recommendation and have been doing some of this already. The NRES program currently has two students who serve as CAFE ambassadors. At the fall 2021 CAFE welcome, upperclassmen were involved in an exercise to mentor new students.</p> <p>At the fall 2021 internship forum, three alumni speakers spanning three decades (1990s, 2000s, 2010s) shared their stories with the current cohort of students to enhance networking opportunities for current students and engage alumni. We propose establishing an Alumni Connections coordinator to build and maintain alumni connections.</p> <p>Despite growing enrollment, the program has a low percentage of underrepresented minorities, thus, future recruitment efforts will be targeted in this direction.</p> <p>We have a concrete plan for students who transfer from the Environmental Science Technology program at Bluegrass Community and Technical College (BCTC) and have seen an</p>	<p>Steering Committee members will continue to nominate worthy students as CAFE ambassadors. The academic coordinator will be responsible for building peer mentorship as an ongoing program and making sure our recruitment is enhanced and attractive to under-represented minority students.</p> <p>The Alumni Connections Coordinator will further engage alumni and stakeholders.</p>	Ongoing

<p>Technical College System, high schools, 4-H, youth nature center programs, etc.</p>			<p>increase in the number of transfer students in the last few years.</p>		
<p>2. Expand and enhance communication strategies (CAFE SP Goals 2 & 5)</p> <p>a. Increase internal and external communication efforts, expanding specifically both electronic and social media content. This may require additional part-time staff involvement with the assistance of rotating student support.</p> <p>b. Enable and encourage student, alumni, and stakeholder participation on communication initiatives through invited editorials, alumni profiles, networking updates, etc.</p>	<p>E</p>	<p>A</p>	<p>We agree and have been doing some of this through invited alumni editorials and profiles via the bi-annual Newsletter. As mentioned above, the new Alumni Connections Coordinator will build alumni connections and coordinate the spring/fall newsletter with the two paid student assistants as a way to facilitate those connections.</p> <p>The student assistants have been trained on the new CAFE website platform and will assist the academic coordinator in enhancing the website and social media presence by strengthening communication with current and prospective students.</p>	<p>The academic coordinator and student assistants will revamp website using the CAFE platform and build social media content.</p> <p>The Alumni Connections coordinator will develop newsletter with student assistants to highlight alumni.</p> <p>The academic coordinator will continue the practice of sending out weekly emails to current students about course updates and job/internship opportunities.</p>	<p>Ongoing</p>
<p>3. Expand alumni engagement and philanthropic efforts (CAFE SP Goals 2 & 5)</p> <p>a. Rebuild and enhance the NRES alumni database.</p> <p>b. Engage alumni and external stakeholders through an annual social event. This could align with the NRES Fall Forum for timing. Explore the potential of enabling remote participation for distant alums and stakeholders.</p> <p>c. Utilize communications with alumni and stakeholders (i.e., newsletter, social media) to enhance awareness of</p>	<p>E</p>	<p>A</p>	<p>We concur with this recommendation. The past NRES chair, the Director of Undergraduate studies, and current chair met with CAFE Office of Alumni and Philanthropy to enhance and update the alumni database. One of the challenges to tracking down alumni from the program is that it has changed names, starting off as an individualized program followed by Natural Resources and Conservation Management (NRCM), and most recently NRES. We have jumped past this hurdle with a full roster of alums from all three degree titles that have awarded.</p>	<p>The Alumni connections coordinator will focus on building connections with alums-capitalizing on our relationship with the CAFE Office of Alumni to foster those connections.</p> <p>The SC chair will take lead on coordinating the development of a prioritized fundraising portfolio in collaboration with the Office of Philanthropy, ideally with targeted initiatives (e.g. funding scholarships for NRE 320 Robinson Forest, Costa Rica).</p>	<p>Ongoing</p>

<p>programmatic initiatives and engage them in fundraising and networking opportunities.</p> <p>d. Develop a portfolio of fundraising priorities that cover different categories of giving opportunities and a range of target dollar amounts to be raised. Work with the CAFE Office of Philanthropy to set clear and specific fundraising goals, identify prospective donors, implement campaigns, and track progress toward targets with faculty, stakeholders, and the alumni.</p>			<p>The current challenge is to gather contact information for those we are not yet connected with, as well as to strengthen connections with all of our alums.</p>		
<p>4. Establish a Stakeholder Advisory Board (CAFE SP Goals 2, 3, & 5)</p> <p>a. Rebuild and enhance the stakeholders list. Compare these data to the alumni list to identify connections and define additional opportunities.</p> <p>b. Develop a plan to establish a Stakeholder Advisory Board that includes Bylaws which clearly articulate a mission, the purpose, a structure, and member terms.</p> <p>c. Proceed with establishing a Stakeholder Advisory Board.</p>	E	A	<p>This is a good recommendation. As mentioned above, an accurate alumni database has been developed and contact information is being gathered. The alumni list will be utilized to identify potential stakeholders from which a separate stakeholder list will be developed.</p> <p>A plan will be established, including the mission, purpose, Bylaws, and a list of roles for stakeholders.</p>	<p>The SC chair will work with the Alumni connections coordinator and the academic coordinator to build a stakeholder list.</p> <p>The SC chair will work with SC members to develop the structure for the Board and recruit for the Stakeholders' Advisory Board.</p>	Fall 2022
<p>5. Diversify and increase financial resources for the NRES budget (CAFE SP Goals 3 & 5)</p>	E	A	<p>The program has grown 30% since fall 2020-this might result in additional revenue coming back to the program based on the net tuition revenue model (NTR).</p>	<p>Once the alumni and stakeholder databases are firmed up, the SC chair will launch a fundraising effort, ideally using targeted initiatives (e.g. funding student scholarships for summer field</p>	Ongoing

<ul style="list-style-type: none"> a. Work with college leadership to identify, assess, and develop new and diverse funding sources to grow the program's enrichment fund. Involve alumni, stakeholders, and students. b. Explore the potential of income-generating programs and initiatives such as online courses, workshops, summer camps, etc. c. Develop and implement a philanthropy plan (see #3 above). 			<p>As the alumni and stakeholder lists near completion, we will meet with the CAFE Office of Philanthropy to develop a portfolio of fundraising priorities with clear and specific goals after identifying prospective donors.</p> <p>Targeted initiatives-perhaps fund a student for Robinson of Costa Rica</p>	<p>experience) in collaboration with CAFE Office of Alumni and Philanthropy. We will also track and contact recently graduated students. We will also cooperate with the College administration to assess where the program stands in terms of NTR return.</p> <p>Will explore the potential of online courses/programs.</p>	
<ul style="list-style-type: none"> 6. Enhance and implement the existing (and excellent) DE&I plan (CAFE SP Goals 4 & 5): <ul style="list-style-type: none"> a. Create a diverse and inclusive external stakeholder advisory board. b. Identify and honor inclusive voices (for example, guest lectures, recruitment, DE&I planning). c. Support efforts for the inclusion of Kentucky State University faculty in academic collaborations. d. Encourage student involvement in DE&I efforts and initiatives. e. Invite faculty to participate in CAFE sponsored DE&I webinars/initiatives and discuss how to implement recommendations in the NRES Steering Committee. 	E	A	<p>The DUS, AC, and Chair met with the Assistant Dean of Diversity (Dr. Mia Farrell) to discuss steps towards enhancing DE&I in the program. Jennifer Hubbard-Sanchez was brought aboard as a co-teacher for NRE 365 in spring 2021. Courses were identified at a SC meeting taught by underrepresented minority (URM) faculty at UK which advisors could encourage NRES students to enroll in during future advising sessions.</p> <p>Explore the possibility of a DE&I coordinator.</p>	<p>The SC will continue to identify courses taught by diverse UK instructors and include these in the advising notes for future reference.</p> <p>Efforts will be made to provide more balance in representation on the NRES SC and in the development of the external advisory board.</p> <p>The SC chair and academic coordinator will work to accomplish goals related to the DE&I plan.</p>	Ongoing

<p>7. Invest in infrastructure (personnel and physical facilities) (CAFE Goals 5 & 6)</p> <p>a. Work with college leadership to identify and address facilities concerns. Priority should be given to needs that are limiting student and faculty recruitment, high impact innovations to the curriculum, and the potential of students to collaborate and build a sense of community.</p> <p>b. Foster collaborative efforts among the existing environmentally-related undergraduate programs. In addition to the NRE 101 course suggested in recommendation 9.c. below, investigate collaborative opportunities around recruitment, curriculum development, event planning, etc.</p> <p>c. Develop/identify resources for procurement of equipment needed for NRES instruction to eliminate the need for “borrowed” equipment from other programs.</p> <p>d. Collaborate with leaders of other interdepartmental programs within CAFE (and across the university) to identify and clarify best practices for effective interdepartmental/multidisciplinary program administration.</p>	E	A	<p>The current office of academic coordinator was found by CAFE administration in response to the previous review. Recently, the Associate Dean of Instruction in CAFE has offered new physical space for the academic coordinator, including larger meeting space, where students can collaborate and interact. This would also heighten visibility of the program.</p> <p>The funding opportunities provided for faculty and students involved in NRE 395 projects is a nice incentive.</p> <p>Build collaborations with the ENS program to complement one another</p> <p>Identify needed resources/equipment for the program.</p>	<p>The SC chair will work with CAFE Administration to relocate the office of the AC</p> <p>The chair will work with the SC to identify needed resources/equipment.</p> <p>SC Chair will meet with ENS leadership to build collaborative ties</p>	Ongoing
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<p>8. Facilitate new input on the NRES Steering Committee (CAFE SP Goals 3 & 5)</p> <p>a. Increase faculty recruitment and engagement on the NRES Steering Committee from departments that are not currently official MOU collaborators.</p> <p>b. Encourage the NRES Steering Committee Chair to be present and engaged at the regular (monthly) college Chairs and Directors meetings.</p> <p>c. Formalize Steering Committee composition to demonstrate intentional inclusion of voting representatives from each field, role (faculty/staff/student), demographic, and participating university college/department. Include an Extension representative on the Steering Committee to bring urban environment perspectives.</p> <p>d. Work with college administration to reassess the division of effort (DOE) assigned for the Steering Committee Chair role. Adjust and align the effort distribution percentage to be consistent with the expectations and responsibilities of this position. Alternatively, work with college administration, the program director, and the Steering Committee to define a leadership strategy which identifies responsible parties for</p>	E	A	<p>We currently have two faculty on the SC from non-MOU collaborators but this can be increased, particularly as the SC chair will work to foster collaborative efforts with other environmental programs on campus (ENS). Three new advisors were added to the NRES advising team from the Departments of Forestry and Natural Resources (FNR) and one from Agricultural Economics (AEC).</p> <p>The SC chair has been attending the monthly Chairs and Directors meetings.</p> <p>Initiate a conversation with the CAFE leadership to develop leadership strategy for Chair, DUS, and SC members.</p>	<p>The NRES SC will work with the College on a leadership strategy for program administration. The chair and DUS will explore engagement of new SC members from departments outside those where official MOUs are in place.</p>	Ongoing
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<p>program administration tasks aligned with faculty capacity and associated DOEs.</p>					
<p>9. Continue NRES curriculum innovation efforts (CAFE SP Goals 1, 4, & 5)</p> <ul style="list-style-type: none"> a. Increase course components that focus on DE&I, environmental justice, and climate change issues in existing classes. b. Identify a mechanism to gain feedback from alumni, students, and external stakeholders concerning emerging issues in the field that should be included in the curriculum. c. Consider the feasibility of a new cross listed NRE/ENS/EES 101 course, perhaps a UK-core course and collaboration between NRES, ENS, EES, SAG, etc. d. Increase available information that conveys NRES curriculum flexibility during both new student orientations and on a continuing basis to matriculated students. e. Consider establishing an urban summer camp that contextualizes environmental issues and field methods in ways congruent with the life experiences of underrepresented minority students and urban communities. 	<p>E</p>	<p>A</p>	<p>We concur with this recommendation. A first step is to encourage current students during advising sessions to take courses taught by URM faculty, several of which are UK core classes as well. Some of these courses in GEO deal with DE&I, climate change, and environmental justice.</p> <p>Due to growth and to enhance retention, the entry-level course, NRE 201, will now be taught both fall and spring by the AC.</p> <p>While we are not ruling out a NRE/ENS/EES 101 course, NRES faculty are fully occupied with other responsibilities.</p> <p>The curriculum flexibility is already being conveyed to students.</p>	<p>The DUS and the academic coordinator will work together to increase course components that address DE&I. As a start, students will be encouraged to take courses taught by URM faculty.</p> <p>The DUS, academic coordinator, and the chair will develop a survey to send out to the stakeholder list to identify areas to augment the curriculum.</p>	<p>Ongoing</p>

<p>10. Explore opportunities to create 4+1 programs allowing NRES students to transition efficiently into educational opportunities leading to graduate degrees. Investigate the potential for academic collaborations on this idea with regional universities and colleges (Transylvania, Centre, Kentucky State University, etc.). (CAFE SP Goals 1 & 5)</p>	E	A	<p>This is a good recommendation. A mechanism to obtain a BS and related MS in five years was supported by a recent survey of current and former students. Some of the upper level courses in the curriculum can be counted towards a graduate degree while concurrently finishing requirements for the BS in NRES for motivated students.</p>	<p>The DUS will work on paperwork to partner with the Integrated Plant and Soil Science (IPSS) program on a University Scholars Program agreement for a 4+1 program.</p> <p>The 4+1 model developed with IPSS will then be used as a template to investigate options with other appropriate graduate programs.</p>	Fall 2022

* 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: Chris Matocha

Unit Head Supervisor Signature: Nancy M. Cox

Date: 2/16/22