The NRES program, like all vibrant academic programs, is constantly evolving in response to changes in the discipline, to internal assessments of student learning and alumni placements, and to what we learn directly from talking to our students. What is different about the NRES program compared to many undergraduate programs is that it is a multidisciplinary program led by a steering committee of faculty from six different departments, whereas most majors are housed within a single department. The ten members of the NRES Steering Committee (see page 16) are each wholly committed to the success and growth of the program, and work creatively together to deliver a program that is rigorous yet flexible, allowing our students to build upon a strong foundation in the social and natural sciences. We recently revised the curriculum to accommodate the changes brought about at the University level (moving from the USP to the UK Core) and to add several new areas of focal interest identified by our students, adding Environmental Education as a new Analytical Skill Development area, and Earth Systems Science and Global Sustainable Food Systems as new Environmental Systems Emphasis Areas. What hasn’t changed are the foundational components of the NRES program: summer camp (now offered at Robinson Forest or in Costa Rica), the internship requirement, and the set of core requirements designed to provide students with a grounding in natural resources and environmental science from which they can tailor their own focus. Please stay in touch, and continue to honor us, and the program, with your suggestions for ways we can improve.

Dr. Mary Arthur
The NRES program aims to make environmentally responsible consumer decisions... starting with this newsletter!

This newsletter was printed on the highest recycled-content paper made for digital machines. It is certified by the Forest Stewardship Council, has 30% post-consumer waste and is manufactured with green power. Not only is the paper sustainable, but the inks used feature a carbon-neutral toner made with plant-based resins rather than conventional polyester resins.

History of the NRES Program (est. 1994)

Unlike the majority of degree programs on campus, NRES is built on a foundation that is interdisciplinary; that is, a collaboration between multiple academic departments. Instead of being managed by a department chair and associated faculty, executive decisions regarding the program are made by the NRES Steering Committee. The Steering Committee is made up of ten members from six different academic departments: 4 from Forestry, 1 from Landscape Architecture, 1 from Agricultural Economics, 1 from Biosystems and Agricultural Engineering, 2 from Plant and Soil Sciences and 1 from Geology. The current scheme has been long in the making though. What is now known as NRES started as an individualized degree program in the College of Agriculture in 1989. This initiative was spearheaded by the Department of Forestry’s Dr. Tom Kimmerer, who served as the program’s only advisor until 1993. It was not until 1994 that the program was approved by the College’s Curriculum Committee and officially named Natural Resource Conservation and Management. In 1999, the first major curricular revision occurred, with significant input from current students. The second major curricular revision took place in 2004, when the old Science and Policy options were dropped to adopt the set of core courses we take today. And finally, in 2009, the program evolved to become Natural Resources and Environmental Science, equipped with more structured and stream-lined process for choosing a “concentration,” namely, the Analytical Skill Development (ASD) and Environmental Systems Emphasis Area (ESEA). Currently, in 2014, the program has just had the fourth major curriculum revision approved, again with the input of many past and current students. While Steering Committee membership and the program itself have faced great change over the past twenty years, there has always been a group of dedicated faculty working and often volunteering their time to keep our beloved NRES program moving forward and excelling in its mission.
National Conference of Undergraduate Research 
2014 at the University of Kentucky

Each year, a National Conference on Undergraduate Research is held at a different university to celebrate the achievements made by undergraduates in research and creativity. This year the conference, known as NCUR, will be hosted at our very own University of Kentucky. While UK is often heavily represented at the conference wherever it is held, this year we will reach an all time high in participation. Four NRES students, Sarah Barney, Karyn Loughrin, Michelle Gilmore and Anna Muncy, have been accepted to present their research projects at one of the event’s poster sessions.

Anna and Sarah both work in Dr. James Harwood’s Invertebrate Ecology lab in the Entomology Department on their own undergraduate research projects. Anna’s presentation will focus on using GIS to analyze the movement of aphids in winter wheat fields over the season. Sarah used molecular techniques to characterize the invertebrate food web in an organic squash system. Both projects have real-world applicability in using insect ecology to manage agricultural systems. Michelle worked with Dr. Andrew Stainback, a member of the NRES Steering Committee, to complete a benefit transfer study quantifying the ecosystem services provided by Kentucky forests. Specifically, she was interested in the monetary value of these forests’ ability to sequester carbon. Karyn also worked with Dr. Stainback and studied the methods for implementing sustainable land use management practices in Nyungwe, Rwanda.

NCUR is not just for those UK students presenting, though. Events related to the conference will take place from April 3rd—5th and are open to all UK students. Examples of events to attend include a graduate school fair, talks by keynote speakers and a performance by local band, Sundy Best. Visit the Council on Undergraduate Research’s website for more information: http://www.cur.org/ncur_2014/

Have an idea for a project that could make UK’s Campus more sustainable?

The Student Sustainability Council (SSC) offers funding to any UK affiliate (faculty, staff and students) wishing to promote the theory, practice and reality of sustainability on campus. Funding is distributed from the collection of a portion of the student fees package known as the Environmental Stewardship Fee. Proposals can be submitted to the council at any time and are granted funding on a rolling basis. Past projects have included diverse interests including guest speakers, undergraduate research, infrastructure, travel and much more. Visit the council’s website to find more information about eligibility and a copy of the proposal application: http://www.sustainability.uky.edu/SSC.
Interested in studying abroad? Attend a First Steps Information Session to learn about the basics of studying abroad with UK including information on available scholarships and financial aid, program types and academic credit. Sessions are held Mondays and Tuesdays at 4 PM and Wednesdays and Thursdays at 3 PM in 207 Bradley Hall. Geri Philpott, NRES Academic Coordinator, is also a valuable resource for finding EA programs with applicable credit to your NRES degree. Visit her in her office at 215 T.P. Cooper Bldg or email her at geri.philpott@uky.edu.

Environmental Studies & Sustainability in Germany

While many students know whether or not they want to study abroad far in advance of when they leave, Vicki decided she wanted to go to Germany her sophomore year and immediately began studying the language. She then attended UK’s Education Abroad Fair her junior year and found exactly what she was looking for: the Environmental Studies and Sustainability program in Freiburg, Germany. The program allowed Vicki to study environmental topics through courses that complemented her NRES degree but were not offered at UK, including: Ethics of Climate Change, Renewable Energies in a World of Transition, and Freiburg Green City: Economic Aspects of Environmental Change. She also took a course in forest management where she was able to compare what she had previously learned about the topic in the US to practices in Germany and even witnessed, first hand forest management in the Swiss Alps. Since the courses were very applicable to NRES, all of her credits transferred and were applied directly towards her degree, allowing her to study abroad for an entire semester without taking an additional semester back at UK. Classes were held Monday thru Thursday allowing the group to travel during the weekends. This gave Vicki a lot more than just an opportunity to study abroad. She was able to take the train with her newfound friends to other cities all over Europe and in the process gained valuable confidence in trying new things. With that, Vicki leaves a word of advice for students interested in studying abroad, “Jump in head first. Immerse yourself in the culture. Do karaoke. Make lots of friends. Go to quiz night at the local pub. Don’t waste any time.”
Environmental Science in Australia

NRES Senior Emma Moreo always knew she wanted to study abroad, but didn’t have her heart set on where to go. What she did know is that she wanted to study somewhere that spoke English and she didn’t want to go to a big city. She also put a lot of emphasis on finding a program that would minimize costs and still allow her to graduate in four years. With this in mind, she narrowed down her many choices and ultimately found a program that she felt was a perfect fit for her. Emma spent her Spring 2013 semester at the Albury-Wodonga campus of Charles Sturt University in Southeastern Australia. She was particularly interested in this school due to its focus on sustainability and its community-centered campus. Even better, this water-stressed campus offered a variety of courses on water resources, which complemented her Environmental Systems Emphasis Area (ESEA). While abroad, Emma took diverse and applicable courses such as River and Floodplain Ecology, Environmental Data Analysis, and Australian Animal Diversity. She was able to do all of this for the price of her usual UK tuition by enrolling in an exchange program and was even awarded an additional stipend by the university.

While at school, Emma stayed in “Rothwell Cottages” where she lived with seven other students. Each cottage was made of rammed earth and featured composting toilets, which together minimized their water use and energy needed for heating and cooling. Emma enjoyed this community-style living situation which enabled her to immediately make new friends.

Although Emma chose to live in a relatively small town so she could better socially integrate herself, she had lots of opportunities to visit other places while abroad. She even traveled to Bali, Indonesia for a week, where she visited a monkey forest, toured rice paddies and rode elephants at the Bali Safari and Marine Park. On the weekends in Australia, she traveled to bigger cities including Melbourne and Canberra, visited a sheep farm and was an active member of the intramural netball team.

Overall, Emma loved her time in Australia, where she was able to make life-long friends and gain a renewed sense of independence. She was also able to gain different perspectives on natural resource issues and came back with a greater understanding of how she fits into the environmental field.
What makes NRES unique? Students agree it’s the multitude of opportunities for hands-on experience!

SUMMER CAMP 2014

The NRES program is quickly approaching the second year in which students will choose between two countries to attend Summer Camp! Students can choose to participate in the traditional summer camp experience at Robinson Forest, where it has been taught for more than 20 years, or the new tropical summer camp taught in Costa Rica. Summer Camp is consistently described as students’ most memorable experience as an NRES student, and no matter which option you choose, you’re sure to agree.

The Robinson Forest summer camp, held in a beautiful forest setting in eastern Kentucky, employs a lot of hands-on learning, where students learn to use various instruments commonly used to conduct field work. Throughout the week, they venture from their cabins to visit various sites including a coal mine restoration site, a stream restoration, as well as mature forests to engage in activities and learn about the ecology around them. The program is led by different instructors for each topic covered, introducing students to faculty and natural resource professionals. Students feel that this summer camp experience gives them valuable skills that will be useful in their future careers.

For students who choose to attend the Costa Rica summer camp, they will be in for an exciting two weeks. To expose students to many different ecosystems, the program takes them to several sites on each coast and across a range of elevations. The overarching theme is astounding biodiversity in tropical ecosystems; topics include causes of biodiversity, threats to vulnerable animal populations, as well as herculean efforts to document, conserve, and educate the public about the country’s rich natural heritage. Students will work in a sea turtle conservation site on the Caribbean coast, spend time touring a sustainable coffee farm and a large-scale production plantation, and visit several internationally renowned biological research stations, national parks, and wildlife reserves. Expert local naturalists will guide students through these contrasting life zones. Program leaders are Steve Price, herpetologist, and Rob Paratley, botanist.

One of the first things used to compare the value of the two camps is the difference in cost. However, the difference in cost of each camp does not mean that students will have a better experience in Costa Rica than they would in the less expensive Robinson Forest. In fact, whichever summer camp you choose, you are sure to have a once-in-a-lifetime experience. Not only will you gain valuable field experience and improve your knowledge of natural resources and environmental science, you will also make lasting friendships and reliable study partners for the semesters to follow.
Summer Camp is not your only opportunity for field experience though...

NRES Course Field Trips

NRE 201: Natural Resources & Environmental Science

NRE 201 is the first course that students take within the NRES program, often making a lasting impact on their interests in natural resources. Students continually describe this course as being valuable, if only for the sense of community that they have gained by the end of the semester. A weekend-long trip to Mammoth Cave National Park is the course highlight, where students have the perfect opportunity to make lasting friendships within the program while doing what they love most: being outdoors!

EES 385: Hydrology and Water Resources

Those students who opt to take their hydrology requirement with Dr. Audrey Sawyer in the Department of Earth & Environmental Sciences get the opportunity to take a mid-semester trip to Wilmore, KY. Here they tour the town’s waste water treatment facility followed by an exciting canoe trip down the Dix River. Students observe the morphology of the river as they paddle and take measurements to describe changes in water quality downstream from a dam.

FOR 599: Herpetology

This upper level wildlife course aims to give students a background in the origins, physiology, ecology and conservation of reptiles and amphibians, as well as the taxonomy of important and/or local species. The lab portion of the course involves many field trips to explore the herpetofauna of Kentucky and learn about important sampling techniques. Field trip locations include the Red River Gorge, Berea College Forest and Raven Run Nature Sanctuary.
NRES Students awarded “Solutions for Sustainability” Grant

Two current NRES students, Elizabeth Patten and Karyn Loughrin, and an NRES alumni and current Forestry graduate student, Chase Clark, were awarded a “Solutions for Sustainability” Grant by the Tracy Farmer Institute for Sustainability and the Environment (TFISE) this past Fall. The team is working with NRES Steering Committee member, Dr. Brian Lee, to develop a survey that gauges the behaviors of UK College of Agriculture, Food and Environment students with regards to their energy usage. They will collect survey data on the likeliness of students to participate in behaviors ranging from line drying their laundry and unplugging their unused electronic devices to purchasing fuel-efficient vehicles and Energy Star® appliances. Off-campus renters will be specifically targeted, since they are often disconnected from their energy usage when utilities are included in their monthly rent. This demographic is also less involved with sustainability-related programs that are available in on-campus housing. When asked about her hopes for the project, Karyn responded, “We’re interested in highlighting the importance of energy efficient activities and choices. Also to bring attention to the lack of knowledge by the general student body when it comes to their energy consumption. The hope is that the University and perhaps even the city would invest in educating students in such a way that helps reduce their carbon footprints and even save them money in the long run.”

Rain Garden Update

The image seen on the right is the beginning of a bioretention facility, or “rain garden” as many of you may know it. It is a collaboration between the Tracy Farmer Institute for Sustainability and the Environment, the Department of Environmental Management and several academic departments, including two NRES Steering Committee members, Drs. Carmen Agouridis and Brian Lee. The project aims to improve effective stormwater management on campus by allowing stormwater runoff to infiltrate the soil, where it is also subject to vegetative filtration. The garden’s design was funded by the city’s Storm Water Incentives Grant Program, while its implementation was funded by UK’s Student Sustainability Council. The basic hydrological framework is completed on the grounds behind the Gluck building; this coming Spring, planting will begin to bring the garden to life! From there, educational and outreach programming will be developed for use in conjunction with the physical display. The team is excited about reaching out to students and other Lexington residents about stormwater and the great impacts that can be made by furthering the development of rain gardens in the community.
Welcome to Greenhouse: UK Debuts New Sustainable Living and Learning Community

There are eighteen Living Learning Programs at UK that are open to first-year students living on campus. Each specializes in a unique topic and is a great opportunity for students to form a community with their peers with similar interests. This coming fall, the College of Agriculture, Food and Environment and the College of Arts and Sciences will debut the newest of these communities: an environmental and sustainability living and learning community known as Greenhouse. Two NRES Steering Committee Members are co-directing the program, Dr. Mary Arthur and Dr. Carmen Agouridis, as well as Dr. Alan Fryar and Dr. Shannon Bell of the College of Arts and Sciences. They hope to accept around 160 students the first year, all of whom will be enrolled in a together in a connected course. This type of connected course is a component of all of the living and learning communities at UK but the Greenhouse course will specifically focus on issues of sustainability on campus and around Lexington. The program has been long in the making and the co-directors are excited to interact with students in the Greenhouse this coming fall semester. One of the main goals for Drs. Arthur and Agouridis is to guide students to become inspired by some facet of sustainability and use their newfound community as a springboard to let their ideas blossom. The co-directors then hope to connect students with the resources they need to continue studying a topic of interest in depth, or to make a change on campus. When asked what she is most excited about with the unveiling of Greenhouse, Carmen responded, “I think it’s an opportunity for some transformation on campus and… that is what I see as the real excitement for me. I think when you get a core group of faculty who are interested in this and a core group of students who are interested and not just in one major...that excites and energizes the faculty. I hope that it also excites and energizes administration to want to start making some of those steps that may change the way we think about the environment and about sustainability on campus and change the way we operate.” Other features of the program include live-in peer mentors, dedicated faculty, a great location on campus and most importantly, a close-knit community of peers who will learn and grow with you as you place your own roots in Lexington.

For more information on how you can get involved with Greenhouse, visit their website at http://greenhouse.as.uky.edu/ or check out the latest podcast: http://greenhouse.as.uky.edu/video/inside-greenhouse-carmen-agouridis-mary-arthur

Pictured above: Students enrolled in Greenhouse will live in the newly-constructed Silver LEED certified residential building, Woodlands Glen II, located near William T. Young Library (Photo credit: http://greenhouse.as.uky.edu/)
Alumni Highlight:  
Dr. Ben Gramig

A 2000 graduate of UK’s Natural Resource Conservation and Management (NRCM) program, Dr. Ben Gramig has taken his undergraduate emphasis in policy and made it his own as a professional. He is currently an Associate Professor at Purdue University where he teaches some of the same courses that he took as a student at the University of Kentucky including Natural Resource and Environmental Economics and Economic Dynamics. Dr. Gramig’s position also involves research in which he focuses on current issues such as the mitigation of climate change in agriculture, the sustainability of cellulosic bioenergy crops and cost-effective agricultural non-point source pollution control. Ben’s initial interest in policy brought him to the Kentucky Governor’s Office of Agricultural Policy (GOAP) where he worked for two years after graduation. Once at the GOAP, his knowledge and interest in agriculture greatly expanded. This position inspired him to continue his education at UK with an M.S. in Agricultural Economics where he worked with Dr. Jerry Skees and now-retired NRES professor, Dr. Craig Infanger. Ultimately, the combination of his undergraduate experience in natural resource policy and post-graduate experience in agricultural economics allowed Ben to become an interdisciplinary scientist and led him to his faculty position at Purdue University.

While he previously imagined himself working as a public policy practitioner or in an environmental consulting firm, Ben enjoys that, as a researcher, he has the freedom to work on projects that interest him most without much oversight. On the subject, he said, “My favorite part of my job is that…I can choose a portfolio of research projects that involve different collaborators and this can change over time to address new or emerging issues.”

Dr. Gramig has gone above and beyond his experience in the NRCM program, yet he still believes his undergraduate foundation at UK was critical to his preparation to be a researcher and teacher today. Ben explained, “NRCM taught me to build a team of experts from multiple disciplines in order to effectively address environmental and natural resource management problems. I currently work with engineers, ecologists, agronomists, climate scientists and political scientists on the different projects that I am involved in. An interdisciplinary approach to teaching and learning is important, so that students learn how their science is used by other disciplines to inform private or public decision-makers and for students to appreciate the diversity of approaches that team members will bring to the table in a work setting after they graduate.” Specifically he noted how, “The Summer Camp and NRCM capstone courses really opened my eyes to how natural and social sciences must work together to address real world problems.”

Ben’s diversity of experiences yielded much great advice for current NRES students. When discussing his favorite part about the program he mentioned, “Flexibility is both an advantage and a disadvantage, but students have to work to take advantage of this. You don’t want to graduate being a ‘Jack of all trades, but a master of none,’ you want to be recognized as a trained expert in a core area—biology, forestry, hydrology, economics—who has an uncommon level of familiarity with other disciplines and the ability to understand how your work fits into the big picture.”

As a final word of advice for students, Ben reminds us to keep an open mind and not become too wedded to any idea for yourself post-graduation. According to Dr. Gramig, “The best opportunities that I have had in my career have been unexpected and were not planned out in advance.” Since you never know who could be offering you your next job or internship, Ben suggests, “Try to introduce yourself to guest speakers and those participating in conferences/workshops you have the opportunity to attend. You can never start building your professional network too early.”
Alumni Highlight: Erin Murphy

Since graduating from the NRCM program in 2009, Erin Murphy is enjoying her career at Stantec Consulting in Louisville, Kentucky, a company that specializes in stream restoration and ecological services. As an Environmental Scientist, some of her responsibilities include stream and wetland monitoring and delineation, geomorphic surveys, water quality studies, environmental permitting, and environmental compliance consulting. What Erin loves most about her career is working with people in a wide variety of disciplines, such as wildlife biology, geomorphology, and environmental engineering. She credits the NRCM program for providing her with working knowledge of many areas outside of her specialty, which is important when collaborating with specialists from other fields.

When asked how her degree prepared her for the position, Erin said, “The NRCM program gave me a broad understanding of environmental sciences and an exposure to a number of different jobs and specialties in the natural resources field.” This knowledge became useful after college because, like many people, her interests continued to evolve as a result of her experiences. In college, Erin focused primarily on geography, soil science, and water quality. However, working for Stantec Consulting spurred her interest in other areas of environmental science. For example, her current position allows her to branch out and take part in habitat studies and biological sampling. Thanks to her studies as an undergraduate Erin is able to make a smooth transition from one project to the next.

Like many students, Erin transferred to UK because her previous school did not provide an environmental science or natural resource major. Upon entering the NRCM major she felt like she had finally found a program that fit her personality, interests, and experience for many reasons. First, the professors were extremely friendly and passionate about their career, which ultimately provided a very welcoming environment for new and current students. Secondly, the small and interactive classes allowed her to make lasting friendships with her peers and professors, which significantly improved her networking skills. Lastly, the specialized course material made her very excited and fascinated about her program of study.

Five years later, after reminiscing on her experience as an NRCM student, Erin would advise students to apply themselves in all of their classes, even if they may not interest them. She affirmed that, “in a field where so many disciplines and sciences come together, you never know how your experience in class will help you down the line.” For her, classes like soil judging and economic botany proved to be worthy of the added effort because she still applies the concepts today. Her final piece of advice, “do not be afraid to experiment with your internships, do not limit yourself to the time required to graduate, and do not underestimate the importance of internships in being able to land an entry level job. Often times that is the only way to distinguish yourself apart from everyone else with a college degree.”
Tips for Student Success

We asked NRES faculty and students what advice they would give for students looking to be more successful. Here is what they had to say!

“Try to do something that is meaningful to you every summer. Use these opportunities to help guide your interests and make important connections with other professionals in your field.”

“Successful students tend to operate from their own agency. Try to find answers on your own, before seeking help from others.”

“Don’t ever forget to follow your passions! And don’t take yourself too seriously.”

“Try to take something away from every course you take, even if you’re not particularly interested. You never know when this information could come in handy at a job down the road.”

“Familiarize yourself with the curriculum and plan the courses you want to take ahead of time. Work with your advisor to plan your schedule a few semesters in advance.”

“One internship or research project is required for your NRES degree. Nothing is stopping you from having more than one! These experiences can lead to jobs so use your time wisely!”

“Know your letter writers. This will be very important once you are trying to establish a career. Use any opportunity you can to make connections and get to know faculty personally.”
Internship Highlight: Chris Goddard

NRES Senior Chris Goddard’s interests in the production of high quality goods in an ethical and responsible way led him to his internship this past summer with Century Aluminum in Hawesville, Kentucky. As an environmental technician, his job was to work with environmental engineers in ensuring the plant was upholding their regulatory emissions standards. He inspected the production facilities daily to prevent any emissions from escaping before going through the wet scrubber and collected data from ambient air stations to compile for quarterly fluoride particulate reports. Chris believes that his experience in environmental law and policy classes helped to prepare him for his internship by allowing him to understand the policy behind the data collection and reporting he was responsible for completing. His position allowed him to see the gravity of environmental issues related to industry and has inspired him to pursue his interests in making this sector more sustainable. Chris’ internship has even led him to the opportunity to work full time as an environmental engineer at Century Aluminum when he graduates in Fall 2014.

Internship Highlight: Ross Bundschuh

As part of the NRES major, students are required to partake in an experiential education program that will provide hands-on learning related to their concentration area. To fulfill this requirement, senior Ross Bundschuh accepted a summer internship with a division of TRC Solutions located in Norcross, Georgia. TRC Solutions is a national company that provides a variety of clients with integrated services in the energy, environmental, and infrastructure markets. With an Analytical Skill Development (ASD) in Economics and Policy Analysis, Ross’ responsibilities included submitting permit applications to the United States Army Corps of Engineers, writing reports to clients and the Federal Energy Regulatory Commission, and consulting with federal agency representatives on proposed liquefied natural gas pipeline projects. He chose the internship because he is applying for law school, and felt this was the best opportunity to get involved in the policy aspect of environmental regulation. Over the course of the summer, Ross was continually impressed by how significant all of the NRES classes were in contributing to his success. He regularly performed tasks that required background knowledge from classes like GIS, Forest Ecology, Hydrology, Principles in Environmental Law, and Conservation Biology. When asked how the internship affected him, Ross replied, “The experience made me realize that the topics we discussed in class are not hypothetical. There is an industry that is devoted to maintaining sensitive areas while extracting and transporting natural resources.” Being able to apply what he learned in class to the real world reinforced his desire to become an environmental attorney. By not only providing students with real world application of their knowledge, but also improving their networking skills and adding to their resumes, internships like these demonstrate the value of the experiential learning requirement.
NRES Program Offers New Focus Areas

A benefit of interdisciplinary programs, such as NRES, is the ability to evolve with student interests and societally relevant issues, allowing students to specialize in a variety of important topics. The NRES program has been in existence for 20 years and has been recently approved for its fourth major curricular revision. One of the best outcomes of this revision is the addition of two new Environmental Systems Emphasis Areas (ESEA), Global Sustainable Food Systems and Earth Systems Science, and a new Analytical Skill Development (ASD) in Environmental Education. These additions are borne from the past demand of individualized emphasis areas in these subjects, coupled with the NRES Steering Committee’s attention to student feedback.

**Global Sustainable Food Systems**

Students selecting this ESEA will be exposed to basic principles in sustainable agriculture, issues in global food systems and the ecology of agricultural systems, emphasizing the overlap and complementarities between systems emphasized through NRES major requirements and food production systems. This ESEA also allows students to minor in Sustainable Agriculture with the addition SAG 101.

**Earth Systems Science**

This ESEA will provide context for understanding the processes that operate within and at the interface between the lithosphere, biosphere, hydrosphere and atmosphere, i.e., the environments in which bedrock, soil, water air and organisms interact physically and chemically. Students have the opportunity to more easily obtain a minor in Geology with this ESEA.

**Environmental Education**

Students in this ASD will be required to take the program’s newest course, NRE 390 Environmental Education, followed by two other courses in Community and Leadership Development or Agricultural Education to further enhance their skills in portraying their knowledge in environmental systems in an educational setting.

*Pictured above: Photos from Tropical Agroecology and Sustainable Development in Indonesia, an education abroad program that was attended by two NRES students interested in sustainable agriculture during Summer 2013. (Photo credit: Alexis Amorese)*
NRE 390: Environmental Education

Included with the recent adoption of a focus area in Environmental Education, the NRES program is unveiling a new course this semester: NRE 390 Environmental Education, taught by NRCM alumna Angela Poe. In this course, students are provided lecture information about the importance of environmental education to influence responsible and environmentally conscious decisions in everyday life. Then, students must put their knowledge to use by relaying information to others in formal and informal educational settings. Each member of the class has to complete assignments that require them to visit local elementary, middle, and high schools to teach classes about environmental education. Students all across the major take this course for various reasons. For example, Erin Klamic is considering a career in environmental education, so she took this course because she felt it would give her an advantage down the road. In contrast, Lindsey Boone enrolled because she wanted to gain a better understanding of teaching methods to spread her knowledge about conservation. Whatever the reason, students can all agree that this class is beneficial to the major because the concepts taught can be carried forward and applied throughout their education and eventually their careers, whatever those may be. Each project is uniquely designed to maximize learning while being exciting to students at the same time. When asked about their current project, Erin Klamic said, “Our current project, Project Wild, is a three week workshop showcasing different activities we can do in an elementary setting to teach children about wildlife. These three weeks are very hands on and people who are not enrolled in the class have been invited to participate as well. So far this has been my favorite part of the course.”

EES 230: Fundamentals of Geology I

With the addition of an Environmental Systems Emphasis Area (ESEA) in Earth Systems Science, we asked NRES/Geology double major, Anna Muncy, to recommend a favorite course to interested NRES students. EES 230 Fundamentals of Geology I is taught every Fall by Dr. Kent Ratajeski, an instructor that NRES students are familiar with as he teaches the only currently required geology course, EES 220. If you enjoyed this course, then Fundamentals of Geology I will challenge you to take this knowledge to the next level. You will learn about topics such as geological mapping, the basics of geological structures and more in depth studies of mineral and rock types. Anna especially enjoyed this course because of the many field trips she was able to take to see the structures she was learning about in the field (pictured below). This new ESEA will provide students with a background in geological processes that can be critical to understanding natural resource issues. Anna describes why she thinks it is important for NRES students to have some understanding of geology, “Geology is all around us. It determines soil properties, the structure of the earth around us, where water goes, what could be in water, it impacts people’s safety, and it determines and alters landscapes and vegetation. Understanding the current geology and how/why it is that way really furthers your understanding of numerous other natural resources and the history of the Earth.”
The following faculty are current members of the NRES Steering Committee.

**Dr. Mary Arthur** is a Professor of Forestry. Her research addresses topics in forest ecology including forest change, prescribed fire and invasive species.

**Dr. Chris Barton** is an Associate Professor of Forestry whose research focuses on stream restoration following disturbance such as agriculture, mining and logging.

**Dr. Dave Moecher** is a Professor and Chair of the Department of Earth and Environmental Sciences. His research focuses on petroTECTonics.

**Robert Paratley** is the curator of the UK Herbarium and teaches Botany in the Forestry Department. Classes taught include: Economic Botany and Dendrology.

**Dr. Chris Matocha** is an Associate Professor in the Plant and Soil Science Department and his research focuses on soil chemistry.

**Dr. Carmen Agouridis** is an Assistant Professor in Biosystems & Agricultural Engineering. Her research focuses on ecosystem restoration as it applies to impacted stream and wetlands.

**Dr. Jack Schieffer** is an Assistant Professor of Agricultural Economics. His research explores the intersection of environmental policy and agricultural and between law and economics.

**Dr. Brian Lee**, an Associate Professor of Landscape Architecture, applies geospatial analyses to watershed-based land use planning.

**Dr. Andrew Stainback** is an Assistant Professor of Forestry whose academic interests are ecosystem services, land use and sustainable development.

**Dr. Dave McNear**, as Assistant Professor of Rhizosphere Science, focuses his work on the biogeochemical processes occurring at the soil-water-plant interface.