This fall students were welcomed back to a UK campus bustling with activity and campus change. Construction of several new dormitories and The 90, a new dining center with student support and academic enrichment areas, was wrapping up as students arrived. Ongoing construction of a long-needed science building, a new student center slated to open in Fall 2017, and more dorms, will ensure that construction will be present on campus for the foreseeable future. But it wasn’t just the construction of new buildings that characterized the campus activity students encountered upon arrival. In addition, there has been road construction along Alumni connected to a FEMA project to improve stormwater management, a new bike path along the edge of the UK Arboretum Woods, and improved bike lanes on some streets. There is lots of change on campus, and at times it can be difficult to assess how those changes impact campus sustainability and the environment. With so much change afoot it seems like an especially good time for students interested in the environment to become engaged in conversations about campus sustainability. And as it happens, there are many avenues to become engaged beyond the classroom. Students interested in being more involved can consider joining the student group Greenthumb, getting involved with the Student Sustainability Council or Wildcat Wheels, or applying for a position next year as a Sustainability Intern. And whether or not these opportunities interest you, it is important for students to be involved in activities outside the classroom.

As always, we hope current students, alumni and other stakeholders will stay in touch, and continue to honor us, and the program, with suggestions for ways we can improve.

Dr. Mary Arthur

Photo credit: Jad Husayni
One of the first courses that students take as NRES majors is NRE 201, Introduction to Natural Resources and Environmental Science, where they become acquainted with Dr. Rebecca McCulley. This is Dr. McCulley’s first year teaching the course, but her knowledge and experience in the environmental sciences goes all the way back to her days in high school. After discovering a passion for science through high school science fairs, Dr. McCulley studied Biology at Rice University in Houston, TX, as a third generation student. She went on to complete her Master’s degree in Rangeland Ecology and Management at Texas A&M University, where she studied the ecological effects of woody plant encroachment in south Texas grasslands, and found that woody plant proliferation significantly increases soil respiration, as well as enhances soil carbon and nitrogen pools. After briefly considering environmental consulting (by brief I mean one interview – all it took to convince her that her future lay elsewhere!), Dr. McCulley turned her focus back to research and completed her PhD in Ecology at Colorado State University. Her research focused on the biogeochemistry of grassland ecosystems, and showed that soil microbial communities differ among various native grassland communities. It also illustrated that carbon cycling rates increase but nitrogen is more tightly conserved across a gradient from shortgrass steppe to tallgrass prairie. She continued studying the impacts of human land use on grasslands while conducting her post-doc at Duke University.

Dr. McCulley joined UK’s faculty in 2006 and began teaching PLS 103/104 while continuing to do research on grassland ecology. She also spent some years on the steering committee for the Sustainable Agriculture degree program curriculum before deciding to redirect her teaching efforts to the natural resources aspect of the environment. The NRES program had an opening to teach NRE 201 this fall, and Dr. McCulley emerged as the best candidate to fulfill the position.

Under her guidance, NRE 201 now takes a slightly different approach to introducing students to the major than in previous years. Dr. McCulley has outlined a number of goals for this class. The course follows a new textbook that introduces students to several of the contemporary issues underlying natural resources and the human dimensions that influence them. In addition, multiple group presentations are geared towards improving students’ teamwork in preparation for the Capstone course their senior year. A written assignment encourages students to consider career and internship possibilities in their areas of interest, while also offering a chance to practice writing cover letters and resumes. In addition, the students go to Mammoth Cave, under the leadership of NRES Academic Coordinator Geri Philpott, for two days to participate in cave tours and fresh water mussel sampling! NRE 201 is a great introductory course, facilitating getting to know your peers and exposing students to the ins and outs of the subject matter that a degree in NRES entails.

Outside of the classroom, Dr. McCulley is the Interim Director of the Tracy Farmer Institute for Sustainability and the Environment, a campus-wide organization that aims to promote sustainable solutions to meeting our everyday needs. With her involvement in so many activities it seemed relevant to ask Dr. McCulley for some advice regarding career planning and success. Her response? Just start pursuing your areas of interest and realize that you have to build a resume. Even if something proves disappointing, it is not a lost experience. You have to get experience to figure out what you want to do - especially with how competitive the workforce is today.
Staff Highlight: Geri Philpott

By: Katie Morrison

Four and a half years ago the NRES program advertised a new position for an Academic Coordinator. Who better to fit the bill than Geri Philpott? Originally from Bethel, Connecticut, Geri has travelled to 48 states and 10 countries building a background that is as diverse as the NRES curriculum!

Geri began her studies at Roger Williams University in Bristol, RI, majoring in Psychology with a focus on animal behavior. She supplemented her course work with jobs and internships every summer, completing an animal husbandry and behavior course at the Roger Williams Park Zoo in Rhode Island and working with Washoe, the first non-human to acquire a human language, and four other chimpanzees at the Chimpanzee and Human Communication Institute in Washington. She also worked a weekend job for the Connecticut Department of Environmental Protection, doing various tasks at several state parks. Toward the end of Geri’s undergraduate career she took a semester off from school to take a position as the first-ever Advanced Animal Behavior Assistant at Disney’s Animal Kingdom.

After graduating from college, Geri participated in a semester course at the National Outdoor Leadership School (NOLS). She then gained experience through working in several short-term positions, including teaching at a children’s environmental education camp in TN, conducting research with black footed ferrets and black tailed prairie dogs in SD, and working as an educator at the Carolina Raptor Center (where she later became Education Director). Having honed her interests in these varied positions, she entered graduate school at Antioch University New England in Keene, NH, where she completed her Masters of Science in Environmental Studies with a concentration in Environmental Education. During this time, Geri travelled to Ecuador, the Galapagos Islands, and Yellowstone on research trips, all of which helped her to secure a job as the Education and Training Coordinator for an international biodiversity program at the Smithsonian Institution in Washington, D.C. Geri’s next position was with the Association of Zoos and Aquariums as the Professional Training Manager where she travelled to zoos and aquariums across the country organizing educational training programs for professionals and coordinating a Master’s degree program.

Four years ago, Geri accepted the position of NRES Academic Coordinator. Geri has since become an important asset to the NRES program, and is dedicated to creating new opportunities to enhance the student experience. For example, Geri brought the Wilderness First Responder Course to UK, providing an exciting opportunity for NRES students and others to develop their wilderness medical skills. Geri has also worked closely with Education Abroad (EA) to build stronger connections between NRES students and EA opportunities. The NRES Costa Rica summer camp was a direct outcome of Geri’s efforts to develop a study abroad course designed expressly for NRES students. This course is a great way for students who have never travelled abroad to test the waters of international travel for the first time with people they know.

Geri’s advice to students: create meaningful experiences outside of the classroom and make professional connections. You never know who has connections to whom or where your next job may be.

Pictured above: (left) Geri Philpott with a Komodo dragon. (Photo credits: Geri Philpott).
Education Abroad: Sam Sosa

By Jad Husayni

The NRES program attracts a diverse population of students with boundless enthusiasm for learning and adventure, and the students and alumni who travel abroad each year reflect these distinguishing characteristics. Take Sam Sosa, for example, a 2012 graduate of the NRCM program. Sam is coming to the end of his two years living in Mongolia as a member of the Peace Corps, a career path that may seem unconventional to most people, but to him is the most fitting way to reach his personal and professional goals. So how did someone from Corbin, KY, end up living in a ger (a circular house traditionally used by nomadic herders) on the opposite side of the world? By pursuing his interests, taking some chances, and planning ahead for the future!

During his time in the NRCM program, Sam focused on wildlife biology and management while also earning a minor in biology. After graduating, he spent nine months on a remote Pacific Island working as a volunteer for the U.S. Fish and Wildlife Service (USFWS). His work there involved eradicating the invasive yellow crazy ant population, Anoplolepis gracilipes, which is detrimental to ground-nesting seabirds. Wanting to continue his work for the USFWS, Sam next volunteered as a wildlife technician at Sam D. Hamilton Noxubee National Wildlife Refuge in Brooksville, MS. For a year and a half, living off a small stipend and free housing, he worked with the endangered red-cockaded woodpecker, conducting nesting surveys and habitat maintenance in addition to assisting with several other wildlife management projects.

Sam enjoyed working for the USFWS so much that he decided to look for ways to make it his career, and that ultimately led to the Peace Corps, which was attractive for a number of reasons. First, he wanted to become more of a world citizen, and the Peace Corps offered him the chance to continue his passion for traveling. It also allowed him to learn a new language and immerse himself in a culture that was completely new to him. An additional motivator were the benefits he will receive after completing his two years in the program: those who satisfactorily complete the Peace Corps program are eligible to receive up to three years of non-competitive eligibility for government positions, so he will bypass the application process for jobs with the USFWS. Having this three-year window will allow Sam to complete a Master’s degree in ecology and still be eligible for government positions afterwards. It was a perfect fit.

During the application process, Sam was relatively indifferent about where or how he spent his two years; his only preference was to work in the Environmental Sector of the Corps, if possible. Unfortunately, the only available positions they had were in the Community Youth Development sector, which he eagerly accepted. Shortly thereafter, Sam shipped off to Sukhbaatar, Mongolia, where he lived with a host family for the first two and a half months to learn the language and culture. After getting accustomed to his new environment, Sam was ready to begin his job as a social worker at Umnugovi Polytechnic College in Dalanzadgad, the capital of the Umnugovi province in the Gobi desert.

Pictured above: Sam poses with a bactrian camel, Camelus bactrianus, in the Gobi Desert. (Photo credit: Sam Sosa)
Education Abroad: Sam Sosa (cont’d)

Life in Mongolia is far different from Western culture. Sam oftentimes wakes up to frigid temperatures in his ger and has to stoke a fire out of coal and dung before beginning the day’s activities. He also has to fetch his water from a neighborhood well. This all seems adventurous enough, but what Sam enjoys most is the variety of responsibilities in his day-to-day life. As a social worker, he teaches students essential life skills like the importance of volunteering and career planning. Another responsibility includes teaching English to several of the school’s faculty and staff. Outside the classroom, Sam is involved in a number of after-school clubs. He helps the teachers in English club prepare lesson plans and improve student involvement, and also leads a boy/girl scout club and an environmental club. Of all the activities he participates in, Sam’s favorite occurs every Saturday when he helps teach his native language at a community English class. He says practicing English with 13-40 year olds is a very rewarding experience and a great way to become better connected with the surrounding community. Work like this ensures that the community and its youth will continue learning important developmental lessons long after Sam’s tenure is over.

All of his success in Mongolia has not come without hardships, too. Learning the Mongolian language and culture was difficult in itself, but adjusting to cultural differences in time management proved to be the most challenging. Sam said meetings usually start an hour late, schedules change at the last minute, and communication with regard to such changes is few and far between. It taught him to go with the flow and that nothing is set in stone, which to him are important life lessons that he had never fully realized. Sam pointed to a number of professors in NRES that impacted him greatly, and when asked to provide current students with some advice he recalled a lasting impression from his days in the program. “Just as in ecology, it is best to be a generalist rather than a specialist. As a generalist, you have the potential to fill many different roles, whereas the specialist can fill maybe one or two. Pursue your career as a generalist for several years. Only then should you consider making yourself into a specialist.”

Good luck to you Sam, thanks so much for sharing your fascinating adventure, and we look forward to catching up with you in the future!
A Semester in Spain with Karina Fuentes

Karina has always been fascinated by the rich culture of Spain and has felt a strong connection because of her Spanish ancestors. When the opportunity to study abroad in Barcelona presented itself junior year, Karina couldn’t resist. In Barcelona Karina spent her weekdays studying at Universitat Autònoma de Barcelona alongside other international students. On the weekends, she immersed herself in Spanish culture, attending futbol games, watching flamenco dance, eating the delicious Spanish cuisine and sightseeing. One of her favorite activities was hiking up Montserrat Mountain for the jaw-dropping view of the beautiful landscape surrounding the city. Barcelona presented its own rich opportunity for immersion. Karina was amazed by the architecture, especially the intricate work of the famous architect Antoni Gaudí, who designed the famous Sagrada Familia. She loved the passion the people of Barcelona feel for their city, and felt welcomed by her host mother, who has lived in Barcelona her entire life and wishes to live nowhere else. Although Karina is fluent in Spanish, the unique Catalan dialect of Barcelona was initially challenging. After a few weeks, though, she began to pick up their unique phrases and was able to communicate effectively.

Karina was constantly analyzing the city for its sustainable practices and cultural awareness of environmental issues. She found that the city was very conscious of recycling and reducing litter, with large bins located all over the city. It was easy to commute without a car, as mass transit by bus and metro was readily available, and effectively coupled with a bicycle rental system. And many restaurants used local ingredients and participated in composting programs. She was amazed “to see a city so enriched by its history also be progressive and environmentally conscious.” This program was an incredible learning experience for Karina. She will apply what she learned abroad to her final year as an NRES student, but also after she graduates and begins her career. Karina’s advice to NRES students is to ‘go for it.’ Even if they are unsure about studying abroad, they should take the first steps and visit the Education Abroad (EA) office. As an intern at EA, Karina has learned that there are programs to fit everyone’s preferences.

A Year in Britain with Michaela Rogers

Studying abroad for an extended period of time has been Michaela Roger’s goal since she entered college; when she found Lancaster University’s Environment Center’s wide array of classes she knew she had found a program that would translate well to her NRES studies. Michaela spent her junior year in England becoming fully immersed: she played for the University of Lancaster club field hockey team, worked in the Insect Ecology Lab, and traveled with friends throughout Europe. Her biggest challenge while abroad was adjusting to different expectations from professors, especially in courses in which students in their final year knew how everything works in British universities, such as term lengths, exams, and grading systems. Although it was a difficult adjustment, she was assisted by the mix of British and international students with whom she lived.

Michaela was most interested in learning how England deals with conservation issues, which she did by taking a Conservation in Practice course. This course taught her about the species and landscapes that are a priority in Britain and how they are managed under both UK and European policy and law. She also had the opportunity to visit some of these conservation projects and talk to managers, greatly embellishing her understanding of the similarities and differences in conversation management in Britain and the US.

Michaela’s main goal was to fully experience life as a Lancaster student, and to understand the culture and history of the area. With the field hockey team, she played in the Roses tournament, a rivalry between York and Lancaster, based on the War of the Roses. She toured the Lancaster Castle, and participated in holiday events, watching fireworks on Guy Fawkes Night, and going to as many Christmas markets as possible during the holiday season. Overall, she had an adventure that enhanced her NRES experience, and helped her make lifelong friends. Michaela’s advice to students considering study abroad is to start preparing early, as it takes a lot of time to decide the classes you will take and get them approved. Despite the effort, she says it is well worth it.

“Go for as long as possible! Even if you are hesitant, you won’t want to leave once you make friends and get settled into your new home.”

Pictured above: (left) Karina Fuentes at one of Barcelona’s hidden secrets, “The Bunkers” (Photo credit: Karina Fuentes); (right) Michaela Rogers standing in front of Big Ben in London (Photo credit: Michaela Rogers).
**Sustainable Opportunities Around Campus**

By: Katie Morrison

**Adopt-a-Tree Program**

The tree canopy in Lexington is in need of advocates to help maintain a more robust and healthy urban forest! The Adopt-a-Tree Program, the brainchild of the Urban Forest Initiative (UFI), an organization started by Dr. Lynne Rieske-Kinney, Dr. Mary Athur, and graduate student Nic Williamson, was created to make us all into Tree Ambassadors. Nic says, “Trees provide us with benefits all the time, even when we aren’t paying attention. Wouldn’t it be great if everybody adopted one (two, three, ten!) trees?”

The Adopt-a-Tree program provides a vehicle for people to do that. Through this program, adopters identify their favorite tree, measure the diameter, and use this information to calculate the benefits that tree provides to the community. These benefits include stormwater interception, energy conservation, and carbon sequestration. In addition, treekeepers share a short narrative as to why they chose that particular tree. In this manner, the Adopt-a-Tree program allows participants to learn something new about a favorite tree and trees more generally, but also to be an advocate for it—in some ways giving the tree a voice. This program, which has been adapted to all age groups, is a vehicle for awareness of the value and importance of our urban forest in Lexington. Two NRES students, Mariah Lewis and Jad Husayni, have adopted campus trees. Mariah adopted the ‘grace’ smoketree at the Arboretum. She chose this tree because its unique characteristics remind her of the Lorax by Dr. Seuss, her favorite book as a child. Jad adopted the large pin oak at “The 90” because, to him, it is one of the prettiest trees on campus, providing a brief moment of serenity every time he passes it. Seeing this tree everyday allows Jad to take a moment to appreciate how enormous it is and notice the differences from day to day. Whether it was the changing colors of autumn, or the stark contrast after a winter snowstorm, this tree always offered Jad a welcome distraction from the day’s activities. Adopt-a-Tree is just getting started, and UFI has many goals for the program, including plans to work with area schools to incorporate the Adopt-a-Tree program and associated curriculum into their classrooms. So far 16 trees have been adopted through Adopt-a-Tree with many more expected as the fall semester continues.

Visit https://uktrees.ca.uky.edu/adopt-a-tree to find out how you can Adopt-a-Tree

**Sustainability Internship Program**

The Office of Sustainability partnered with the Student Sustainability Council and the Tracy Farmer Institute for Sustainability and the Environment (TFISE) to revamp the Student Sustainability Internship Program, to offer six year-long paid internships for undergraduate students to engage in sustainability work through ongoing projects at UK. Each of these interns spends half their time supporting the work of an existing campus initiative and the remaining time developing an independent project with the help of their UK faculty and staff mentors. Three of these internships are mentored through the Office of Sustainability and work on campus efforts in energy, waste reduction, and transportation. The three other internships are mentored through one of three TFISE working group: Food, Urban Forest Initiative, and Water Systems.

The work of the Urban Forest Initiative (UFI) may be of special interest to NRES students and alumni, with its focus on connecting people to the urban forests of UK campus, Lexington and the Bluegrass Region through social media, community outreach, research and education. This year’s UFI Intern is Amanda Williams, a Biosystems and Agricultural Engineering junior specializing in Bioenvironmental Engineering. Amanda assists with development and implementation of urban tree outreach and education projects through social media, website updates, and representing UFI at events such as Arbor Day and Reforest the Bluegrass.

Amanda heard about this position on Green Talks, a talk show on UK’s student-run radio station, WRFL. Amanda has been concerned about the health of the environment for as long as she can remember. Wanting to make a difference and contribute positively to improving sustainability, she saw an opportunity through this internship, which has connected Amanda with a network of people and resources she could not have found otherwise. Amanda’s first independent contribution to UFI has been recognizing that UFI’s outreach to students could be greatly enhanced through the use of Twitter. Amanda recently created a UFI Twitter page (@UrbanForestLex) with the goal of elevating the visibility of the urban forest in our community.

Information on future opportunities will be announced in March 2016 at:
http://www.sustainability.uky.edu/internships

Pictured above: (left) Jad Husayni standing underneath his adopted pin oak, *Quercus palustris*, at The 90 (Photo credit: Jad Husayni); (right) Urban Forest Initiative Intern, Amanda Williams (Photo credit: Amanda Williams).
Internship Highlights

By: Katie Morrison and Jad Husayni

Erin Klamic

This summer, Erin Klamic completed an exciting internship at the National Aquarium in Baltimore. Erin’s internship was with the Education Department, which manages visitor programs and hosts a formal education team. Erin’s role within the visitor programs was to manage “discovery carts,” which provide visitors with information on various conservation themes and teach them about the ecology and life history of the animals at the aquarium. With the education team, Erin helped to set up displays for programs, while also working “touch tables” that held the programs’ props and artifacts. Erin’s focus areas are in Environmental Education and Human Dimensions and Natural Resource Planning, and this internship gave her great experience in both of those fields. Erin found it both fulfilling and challenging to work with people of all age groups. She enjoyed having discussions about natural resources and the environment, but at times found it difficult to discuss some topics with people who held opinions that differed from hers. Encounters like these taught her that working in the environmental education field will require both patience and understanding, but it also reinforced her desire to continue down that path. When asked which NRES classes were the most applicable to her internship, Erin said that the knowledge she obtained in all of her classes contributed in one way or another. Gaining newfound perspectives from her internship also motivates her to apply herself more in classes that she might not otherwise consider important to her future goals. Speaking of the future, Erin hopes to further her experience in environmental education or work towards a position as a sustainability coordinator. No matter what, it is apparent that her energy and enthusiasm for the environment will lead to a successful career in whatever field she chooses.

Jad Husayni

Wanting to experience Lexington in the summer, Jad Husayni set out to find a local internship. During a meeting with Geri Philpott, NRES Academic Coordinator, Jad learned of an internship that seemed to be a perfect fit for someone, like him, with a focus in water resources. Over the summer Jad worked for the Lexington-Fayette Urban County Government (LFUCG) Division of Water Quality as a Basin Inspector.

Jad’s primary responsibility was to inspect the city’s storm water infrastructure, namely detention and retention basins. Detention basins are designed to hold storm water for 24-48 hours following a major rain event and let the water drain slowly. The city has about 1200 of these basins that need to be inspected twice a year for structural integrity and proper functioning (Jad visited 20-30 of these basins on inspection days). Retention basins differ from detention basins in that they retain water all of the time, and the city has 110 of them. Typically, if something goes wrong with a retention basin the impacts are more damaging and costly; compared to detention basins, so they need to be inspected every month. Jad started each month inspecting all the retention basins, which typically took two weeks, and then would switch to detention inspections for the remainder of the month. During these inspections he looked for any problems that would affect the functionality of the basin (i.e. blocked inlets or outlets, excessive erosion of the basin walls, siltation). He reported any basins that were out of compliance and together with his supervisor they would either make minor improvements themselves or his supervisor would contract a company to make the necessary larger repairs (like dredging out a basin).

This internship offered Jad great work experience in a professional setting. He enjoyed the responsibility and routine of working full-time, and getting paid every two weeks definitely reinforced that. Jad would recommend this internship to any student interested in water resources. Water resources are a vital component of environmental management in any community and working for the local government taught Jad a lot about water policy and infrastructure. To students searching for jobs or internships, Jad says, “Network. Ask your professors where to look for internships and apply for as many as you can. Be open to new experiences. Even if you’re only remotely interested in something, explore that interest until you exhaust all options. You can’t learn from the experience you don’t have!”

Photo credits: (top) Erin Klamic; (bottom) Jad Husayni.
Research Highlights

By: Jad Husayni and Katie Morrison

Caroline Engle

Caroline Engle, an NRES senior, is conducting research on the social and political strategies that were successful in stopping the construction of the Bluegrass Pipeline. The pipeline was proposed to transport natural gas liquids from the fracking fields of Pennsylvania, West Virginia, and Ohio to processing plants and export terminals along the Gulf Coast. It would have crossed twelve Kentucky counties, posing a significant environmental threat to communities and water resources across the state. Caroline was very involved in the student resistance movement opposed to the pipeline, so she decided to conduct this research to better understand the benefits the information could have for other communities facing similar challenges. To gather her information, she learned how to conduct and transcribe interviews with environmental experts, policy leaders, and community members. She also learned a great deal about the Institutional Review Board, which oversees research with human subjects, and the processes that affect decisions regarding fossil fuel infrastructure. Her research project is being conducted under the guidance of Dr. Shannon Bell, an Assistant Professor of Sociology. Together they hope to share the information at conferences and summits to aid other states that are fighting proposed pipelines. Caroline enjoys this type of work immensely because she is passionate about the topic and it relates to her chosen career path. After graduating in May, Caroline wants to complete a Master’s Degree in Public Administration with an emphasis in environmental policy.

Waydon Yates

Waydon Yates graduated from the NRES program last spring (2015), having challenged himself to engage in experiences that took him outside of the classroom. With a focus in Field and Lab Analysis of Ecosystems and an individualized focus in Urban Wildlife Management, Waydon’s goal was to learn more about the world around us. While taking Dr. Steven Price’s herpetology class, Waydon decided to approach Dr. Price about conducting independent research. Waydon worked closely with a Forestry graduate student, Mickey Agha, who suggested a project on emydid turtle hatchling emergence, and Waydon signed on. Waydon’s project relied on data collected previously on the emergence of hatchling turtles in the family Emydidae, conducting what is known as a meta-analysis. This is an approach scientists use when they analyze a collection of data sets from other scientists that go beyond the purview of any one study to test hypotheses. Working nine hours per week for two semesters, Waydon started by conducting a comprehensive literature review to obtain a large dataset of all published dates of hatchling emergence. He obtained a second large dataset that included over 20 years of data by contacting researchers for unpublished data on turtle emergence. He combined these data sets and used temperature and precipitation data for each emergence site through time from the National Oceanic and Atmosphere Administration (NOAA). From this statistical analysis of the two emergence datasets, Waydon and Mickey found a significant negative correlation between ‘body mass’ and ‘average date of emergence’ in delayed emerging hatchling turtles, suggesting the largest species exit the nest first. Waydon’s project contributed to a publication as well as a research poster that was presented at the Association of South Eastern Biologists conference in Chattanooga, Tennessee. Participating in this research project and presenting his work at a research conference gave Waydon insights into what it is like to be a professional researcher. He enjoyed the process so much that he is considering pursuing a Master’s degree and possibly a PhD. Though his further study may not be in herpetology, he believes this experience will carry over to his other interest and area of expertise, entomology. Waydon encourages all NRES students to conduct research as undergraduates, as it is a great opportunity to work closely with a faculty member and graduate students, to practice skills in conducting literature reviews and statistical analysis, and to hone writing and professional skills.

Photo credits: (top) Caroline Engle; (bottom) Waydon Yates.
Mountains to Coast: Field Studies in Costa Rica

By: Rob Paratley

Field Studies in Costa Rica is a two week course that NRES students can take to fulfill their summer camp requirement, studying tropical biology and natural resource management issues in this Central American country. Costa Rica is world-renowned for its diverse biota and its reputation as a leader in conservation biology. The course is co-taught by Robert Paratley, a botanist, and Steven Price, a herpetologist, both of whom have several years’ experience teaching in Costa Rica. We explore a number of different ecosystems, travelling across the country from the Caribbean to the Pacific coast, and through the mountain ranges that form the country’s backbone. Sites visited range in elevation from an 8,000-foot volcanic summit to beaches and wetlands at sea level; from lowland rainforests receiving twenty feet of rain per year to the globally endangered dry tropical deciduous forest.

We also discuss land use in Costa Rica as a function of climate and soils, as well as the history of logging and the rapid deforestation of its rain forests, converted to crop production, dairy farming, and ranching. Beginning in the last decades of the 20th Century, the Costa Rican government, with aid from international conservation organizations, has made biological inventory a priority, and has established policies to stem the loss of habitat and biodiversity. Costa Rica’s national parks (we visit four) and biological reserves (we visit three) were created in response to these losses. This effort has made the country an internationally recognized center for tropical biology research, and has spearheaded the development of an economically vital ecotourism industry. Other program highlights include learning about the impact of changing climate on agriculture and conservation, Costa Rica’s diversification of its electrical power generation in an effort to wean itself from fossil fuels, and the contrast between large-scale production commodity agriculture and small-scale, sustainable farming.

Costa Rica is a stunningly beautiful country. Among other things, students see active volcanoes, high waterfalls, and pristine beaches. We stand beneath tropical trees whose massive trunks rise 75 feet to the first branches, see air plants festooning tree branches, tiny orchids the size of a pinhead, and prehistoric-looking tree ferns in the mists of cloud forests. Some of the animal species commonly seen on past trips include: exotic birds—toucans, trogons, macaws, jewel-like hummingbirds; tropical mammals—spider monkeys, 3-toed sloths, and river otters; colorful poison dart frogs and many reptiles—caiman, boa constrictor, and mother green sea turtle coming ashore at night to lay a clutch of eggs on the beach of her birth. Experience the cold wind at the Continental Divide in Monte- verde Cloud Forest Reserve, and the sultry air in the understory of the primary forest at La Selva Biological Reserve, a boat ride along lush, palm-lined canals at Tortuguero National Park, and travel the dusty roads past ranches and fields of rice and sugar cane to reach the dry forest at Palo Verde National Park.

Field Studies in Costa Rica synthesizes subjects in the natural and social sciences, taking you beyond the traditional classroom setting to feature experiential learning in the field, group discussion, local experts, and journal-writing. Students integrate concepts in biology, geography, and resource management to form a dynamic picture of this small, incredibly diverse Central American country.

You can now sign up for the 2016 Costa Rica course! http://www.uky.edu/international/educationabroad/

Pictured above: (left) the class standing between the buttresses of a Kapok tree at La Selva Biological Station, (top right) a Costa Rican sunset, (bottom right) Adam Creamer admiring the view over Palo Verde National Park (Photo credits: Maeve Draper).
Each summer a group of NRES students journey into the mixed-mesophytic forests of eastern Kentucky to attend Summer Camp, a once in a lifetime adventure that inescapably leaves them with a collection of unforgettable experiences. Summer Camp packs all of the different aspects of NRES into three-weeks of hands on educational activities led by professors with diverse natural resource specialties. Single or multi-day topics provide students exposure to a wide foray of natural resource topics: hydrology, herpetology, wildlife management, mine and stream restoration, and forestry, to name a few. This year’s class numbered only seven students, which allowed them to form a close-knit group, make the most out of each lesson plan, and effectively broaden their knowledge of the ecosystems and wildlife that dwell in Appalachian Kentucky.

The first week of Summer Camp was dedicated to familiarizing students with the flora and fauna of the state. Dr. Sarah Hall, an Assistant Professor of Plant and Soil Sciences at Berea College, guided students on a hike through the woods while she discussed the ecology of the native tree species. The following two days were focused on wildlife, or fauna. Dr. John Cox taught students how to track elk using radio telemetry on a reclaimed mine site, took them birding in the forest, and discussed several conservation biology concepts. Dr. Steve Price’s herpetology-themed topic included an afternoon excursion to catch snakes and amphibians in the surrounding creeks, and Dr. Lacki led an adventure to catch bats under moonlight.

The second week started with a bang. Students were offered a partial break from traditional academia for a day when they went rappelling at the Red River Gorge, which was accompanied by a lesson in outdoor leadership and risk management. The rest of the week consisted of learning about the pedosphere (think soils) with Dr. Chris Matocha, making a GIS map of surrounding trails with professor Boyd Shearer, and spending a day studying the ecological impacts of surface mining with Dr. Chris Barton. Of all the week’s activities, the day spent on the reclaimed mine site was the most impactful to student Isabel Cochran. She wrote, “this day has stood out to me more than any other, as it was shocking to see the flat meadow landscape dominated by invasive species that once resembled the rich forest we had been spending so much time in. We witness how difficult it is for native trees to reestablish on the compacted soils, and the drastic impacts of mining on water quality.” Rightfully so, the last activity that week involved learning the basics of stream restoration with Dr. Carmen Agouridis.

With two weeks of Summer Camp under their belts, the group was ready to face their third and final week. Two days spent learning about forestry were supplemented with a field trip to a nearby sawmill, where students learned in-depth about the economic and ecological value of proper forestry techniques. In between a few final hikes to the fire tower near camp, students spent their last days learning about forestry best management practices and sampled for salamanders and macro invertebrates.

Almost as quickly as it had started, Summer Camp came to a close. And with that, the students built one last bonfire, cleared their cabins, and left the woods both excited and reluctant to head back to the reality of life outside of Robinson Forest.
Amy Sohner began her undergraduate career at the University of Kentucky as an Animal Science/Pre-Vet major, but she wanted something to “fall back on” in case things didn’t unfold as expected. As she dove into her studies, she became increasingly interested in environmental science and decided to change majors to NRCM (later to become NRES).

During her senior year at UK, Amy participated in a Study Abroad opportunity at Napier University in Edinburgh, Scotland where she took Animal Behavior, Stream Ecology, Genetics, and Physics, all of which transferred to UK and counted toward her NRCM major. This experience was one of the best of her life. Amy says, “Before going, I was very shy, but the experience of being thrown into a country where I knew no one, and was forced to interact with strangers made me break out of my shell. I am now able to talk to anyone, network, speak publicly and am much more self-assured, and I give all of the credit to my experience in Scotland.” At the time, NRCM was not yet an official major so she graduated in 1998 with a Bachelor of Science in Agriculture, with a focus area in Wildlife Biology.

Her first few years after graduation were spent traveling across the US, waiting tables to support her adventures. She worked for a spring semester as an Environmental Educator with the North Central 4-H Camp and was later hired as a Conservation Education Program Leader at the Salato Wildlife Education Center in Frankfort, KY in 2001. Just before this 9-month position was over, she heard that a new environmental education organization was forming in Lexington. She emailed the newly hired Executive Director (Angela Poe, a fellow NRCM graduate) and asked about volunteering opportunities. Angela immediately contacted Amy and asked if she wanted to interview for the Program Manager position. Amy was hired with Bluegrass Greensource (then Bluegrass PRIDE) and became Executive Director in 2006.

Bluegrass Greensource serves 20 counties in Central Kentucky, teaching students and adults that small behavior changes can have a positive impact on our local environment. In her role, Amy does a variety of activities ranging from managing the day-to-day activities of their 18 staff members and multiple interns to managing the yearly budget. However, her favorite part of her job is working with a group of people who make her proud every day of the work they are doing. As Executive Director, she doesn’t get to work with the students and general public that they serve, but she often gets reports from people telling her how impactful a presentation was that one of their staff gave, or how an education activity allowed a teacher’s students to fully understand a concept.

Amy feels that the biggest benefit her degree gave her (other than the necessary skills and experience to get her job) was the holistic education she received. She didn’t learn a lot about any one specific area of natural resource conservation, but she gained an understanding of how natural systems work together, and are influenced by, human interactions. She uses the knowledge she gained from her degree every day as she directs staff to plan education programs.

Amy’s advice to anyone interested in working in a sustainability field is to participate in internships and volunteer as much as possible. When she graduated an internship/research project was not a requirement, but that is an opportunity she feels she really missed out on. Amy says, “The NRES program is so diverse, I think the best way to discover what you are really interested in is to try a few different things. Internships and volunteering allow you to meet leaders in the field and prove yourself for future job opportunities.”

For more information about Bluegrass Greensource and their internship opportunities visit: http://www.bggreensource.org/
Hailing from Fairfax, Virginia, Tris West was looking for a college that offered degrees in both science and policy related to natural resource management. He was also interested in continuing his music education, as well as living in a more rural area. UK met all of his criteria. Tris graduated with a degree in Natural Resources Conservation Management (NRCM, later to become NRES) in 1994 with a focus area in policy.

After he graduated, he attended graduate school at Ohio State University where he completed his M.S. in 1996 in Natural Resources, with concentrations in Ecosystem Rehabilitation and Ecology Modeling; and his Ph.D. in 1999 in Agronomy with concentrations in Landscape Ecology and Ecology Modeling. From there he continued on to his first job at Oak Ridge National Laboratory where he was the lead scientist on the soil carbon dynamics and full greenhouse gas accounting under the Department of Energy (DOE), Carbon Sequestration in Terrestrial Ecosystems program. Tris conducted meta-analyses on land management and carbon dynamics related to current social issues. He used management and carbon dynamics related to current societal issues, combining biogeochemistry research from the DOE program with remote sensing research from NASA to conduct spatially explicit analyses of sub-national to global land carbon dynamics. Through this project, full greenhouse gas analyses for agriculture, forestry, and bioenergy systems were conducted.

Tris moved on to be a Research Scientist at the Pacific Northwest National Laboratory in College Park, Maryland. There he conducted national to global scale research and analyses on agricultural production and carbon dynamics for use in integrated assessment models, Earth system models, and carbon monitoring systems. He used satellite remote sensing data with global inventory data and spatial downscaling methods to develop spatial approximations of future land cover and land use, combining biophysical models with economic models to project future changes in carbon dynamics.

One day, he was asked to meet someone at a coffee shop near the White House and figured he had better go. He is now the Deputy Associate Director of the White House Council on Environmental Quality where he works for the Executive Office of the President. In his position he works with federal agencies, NGOs, and other relevant organizations to improve the national inventory of land sector greenhouse gas emissions and carbon sinks, organizes development of future land sector emissions projections, and identifies and implements land sector mitigation strategies. His favorite part of his job is facilitating the progress that US governmental agencies are making towards greater understanding of the intersection between land management, climate change, and net emissions, along with using science to guide domestic and international policy on land management and net emissions.

Tris feels that his NRCM degree prepared him for his position by improving his logic skills early in his education and then developing his technical skills in agriculture, ecology, spatial analysis, and statistics. He describes the program as having a balanced curriculum that helped him experience different components of natural resource management while also receiving preparation for graduate school. Tris says, “The faculty were thought-provoking. I would not be in my current position without the effort and preparation that the faculty put into every class.”

For more information the Council on Environmental Quality and their internships visit: https://www.whitehouse.gov/administration/eop/ceq

Pictured above: (right) Tris at the 2012 Global Environment Facility meeting in Kenya. (Photo credits: Tris West)
Senior Capstone 2015

Senior Capstone is a term that many students begin hearing as early as freshman year, but may not completely understand even after they have enrolled in the degree-completing course. Students simultaneously look forward to its finality while feeling apprehensive about the focus on project-based learning conducted in teams. Taught by Dr. Mary Arthur, and taken during the spring of one’s final year of study in the NRES program, Capstone: Senior Problem in Natural Resources is the course that unites NRES seniors before they graduate.

The course is designed to engage students in examining in detail a natural resource or environmental problem in Kentucky. The Spring 2015 Capstone class focused on McConnell Springs, a Lexington historical site and nature park, as an urban landscape with tremendous potential for providing ecosystem benefits to the surrounding community, but with challenges as well. The class of 25 was divided into five groups, each with a specific focus within the park. The groups studied the ecosystem services, soil and water quality, forest community, fauna, and environmental education opportunities at McConnell Springs. They gave an informative open presentation to a full audience of university and community members, and produced a written report that is posted on the NRES website (http://nres.ca.uky.edu/content/capstone). Their camaraderie and extensive group knowledge was evident during their presentation, and their research will continue to benefit the Lexington community for many years.

Last year’s impressive capstone group made the process look simple, but it is important to understand both the capstone course objectives and the greater growth that happens during the capstone class. The NRES curriculum is designed with the goal of creating educated environmental professionals who are capable of field work, research, and analysis that blends an understanding of the social and natural sciences in solving environmental challenges. It also aims to provide graduates with skills to convey their knowledge to interested stakeholders through effective communication. While these goals are clearly seen in the design and implementation of the capstone course, there is an underlying objective of capstone that is critical to preparing for life after graduation.

Capstone presents students with the opportunity to conduct research from beginning to end. It is a time for students to create a plan and fulfill their own expectations, not that of a professor. Students are not tasked with creating a defined, specific outcome, but with conducting a thorough investigation of their topic. Dr. Arthur aims for students to decide for themselves when a project is complete, to set and fulfill their own goals. This is a critical skill as graduates enter the workforce or head to graduate or professional school and must determine when their projects are complete, research is conclusive, and goals are reached.

The capstone course is an opportunity for NRES students to take all that they have learned during their University of Kentucky experience, and showcase their abilities to the university, the community, and especially to themselves.

Course Highlights

If you were to ask students to name one course in the NRES program that was notably challenging, one of the most frequent answers would be Forest Ecology. Taught by Dr. Mary Arthur, Forest Ecology is a 4-credit hour course that is required for all NRES students. It consists of two lectures and one lab each week, and there are typically 40-60 students enrolled every fall semester. Dr. Arthur has been studying ecology and the effects of prescribed fire in eastern Kentucky for several decades, so her passion for the subject ensures lively class discussions and thought-provoking questions during lectures and lab. Her goals for the course are to improve students’ understanding of how forests ‘work’, and to inspire an appreciation for the complexity of forest function and its importance to contemporary society. This class is fairly writing-intensive; there are three written exams and about eight papers of varying length assigned throughout the semester. Assignments are designed to challenge students’ analytical thinking and writing skills, which to Dr. Arthur are vital to any students’ post-college success. In addition, an equal combination of hands-on learning and lecture is designed to cater to at least one aspect of each student’s learning preferences, while challenging them in others. Dr. Arthur finds creative ways to get the most out of her students by constantly adding new ideas and topics to her repertoire of education tools. For example, in recent years she added a new topic to her weekly labs called “urban forestry,” which applies the concepts of forest function to demonstrate the importance of trees in urban landscapes. Dr. Arthur’s students may be quick to comment about the difficulty of her course, but at the end of the semester, all will agree that her lectures, field trips, and assignments are a springboard for academic and intellectual growth.

In Spring of 2015, Dr. Beymer-Farris in Geography taught the first Political Ecology course at UK. This is an important new offering for students focusing in Human Dimensions and Natural Resources, or Economic and Policy Analysis. The problem of how to conserve the earth’s rich biological heritage while enhancing the well-being of some of the world’s poorest people stands as a critical global challenge. The course examines how insights and approaches from interdisciplinary fields of study can address the twin problems of ecosystem health and human poverty. Using case studies from the global North and South to examine the interplay of society, politics, economics, and the environment, this course provides an interdisciplinary exploration of the dynamic and power relationships, multiple meanings, and interactions within and between “society” and the “environment.” It is writing-intensive, enabling students to strengthen their critical analysis and writing skills. The course introduces students to a set of social and ecological theories to understand environment-society interactions, and explores how these understandings are ultimately translated into policies. The course presents a very different way of thinking about ecological systems, giving students a breakdown of the complex relationships within the environment and society. It addresses many questions, but most important, in Dr. Beymer-Farris’ words, are: “What social theories help us understand ‘the environment’ and the interactions between the environment and society? How are environmental problems and issues framed? And, what are the policy implications for local people based on the framing of environmental problems?” These topics require years of study to understand, but in this course, Dr. Beymer-Farris gives students the ability to understand and relate these issues to one another on a broad scale. She plans to teach this course every spring. She is also developing a Gender and Environment (GEO 300) course that will be taught every other year.

Pictured above: (left) Taylor Howlett and Michaela Lambert near their adopted tree (photo credit: Michaela Lambert): a black walnut at Mathew’s Garden, UK.; (right) Dr. Betsy Beymer-Farris, instructor for Political Ecology.
Will Bowling for Leopold Award

By: Zak Danks

Will Bowling, elk biologist with the Kentucky Department of Fish and Wildlife Resources (KDFWR) and NRES graduate, was nominated, along with his family, as one of three finalists for the Leopold Conservation Award®, a prestigious award that recognizes “extraordinary achievement in voluntary conservation” by private landowners. This competitive award is presented in 10 states and is administered by the non-profit Sand County Foundation and, in Kentucky, in association with the Kentucky Agricultural Council and the Kentucky Association of Conservation Districts.

NRES students and alumni will recognize the significance of this award by its namesake, Aldo Leopold. Renowned as the father of wildlife management and an early leader in the conservation movement, Leopold has inspired several generations of wildlife professionals. Ironically, Will’s nomination for this award isn’t for his skill as a wildlife biologist or his top-notch service to the sportsmen and citizens of his native southeast Kentucky – both of which he is known for within KDFWR. Rather, Will is being recognized as a farmer who practices what Aldo Leopold called the “land ethic,” a phrase Leopold coined for living on and working with the land in an environmentally sustainable way.

Will farms with his father Ronnie, mother Gloria, and wife Maggie at their “Old Homeplace” farm in Clay County. They raise naturally-grown vegetables and grass-fed Angus beef, pastured lamb, pork, and chickens, and honey. Their production techniques focus on improving soil health through practices like cover cropping, rotational multi-species grazing, and composting, with little to no inputs of pesticides or animal medications. Their sustainable farming efforts have been recognized by the USDA Natural Resources Conservation Service, which has conducted training field days at the Bowling’s farm. NRES is proud to have a true land steward like Will among its alumni ranks. Please join us in congratulating him and the other two finalists – Charles Williams of Munfordville and Harry and Karen Pelle of Bradfordsville – on their conservation efforts. The winner, announced at the KACD annual convention in Bowling Green, Kentucky, on July 21st, was Charles Williams with West Wind Farm in Mumfordville.

For more information, visit http://www.kyagcouncil.net/leopold-conservation-award.html. To watch Will’s submission video, visit https://youtu.be/G7QsUik4eJw.

Student Opportunities

Mollusk Restoration Opportunity

By: Katie Morrison

The Center for Mollusk Conservation in Frankfort was founded in 2002 by the Kentucky Department of Fish and Wildlife Resources to restore and recover rare and imperiled freshwater mollusks in Kentucky. With a primary focus on the conservation, restoration, culture and propagation of freshwater mussels, their staff have worked with over 70 species of freshwater mussels, 75 species of fish, 12 species of snails, and dozens of algal species.

Geri Philpott, NRES Academic Coordinator, is organizing a trip to the Center for Mollusk Conservation in early November. Students will get a tour of the facility and will participate in tagging endangered mussels in preparation of their release into the wild.

Interested students can email Geri at geri.philpott@uky.edu.

Wilderness First Responder Course

January 2-10, 2016 at Raven Run Nature Sanctuary

NRES is once again offering the Wilderness First Responder (WFR) Course. The WFR course is essential if you are pursuing a professional career in the outdoors. This 9-day course includes a comprehensive wilderness medicine curriculum that focuses on extended care and unique wilderness therapies. You can expect to complete the course with a newfound ability to make tough medical decisions in remote places. It will increase your medical knowledge, skills, and confidence and make you an asset to any team. Successful course completion earns you a WMI Adult & Child CPR certification and a WMI Wilderness First Responder certification. EMTs will earn a Wilderness EMT certification.

Cost is $650.00 for UK/EKU Student and UK Faculty/Staff and $700.00 for Non-UK Participants. University credit can be arranged.

Interested participants can contact Geri Philpott, NRES Academic Coordinator at 859-257-2337 or geri.philpott@uky.edu.

Photo credits: (left) Will Bowling, (right) Geri Philpott.