With a 22-year history of training UK students in environmental science and natural resource conservation and management, we have a rich alumni network that allows us to connect current students with alumni, and recent graduates with more professionally-established alumni. Alumni frequently contact us with internship opportunities, and sometimes these internships lead to job offers. To enhance these sorts of connections and relationships, we are working on several initiatives with the dual intention of improving opportunities for networking among current students and alumni while elevating the visibility of the NRES program. For example, we are using Facebook to increase the sense of community among current students, to highlight the exciting pathways our seniors and alumni are on, and to improve access to announcements about potential internships. We post weekly ‘highlights’ of current seniors, and expect to post a highlight focusing on each and every student before they graduate. We also post bi-weekly ‘highlights’ of alumni, making an effort to include alumni from different years. We have recently begun to use LinkedIn more fully, as this social networking site has the potential to help us find and contact our alumni more readily, and to create connections among alumni from different years. If you are a graduate of our program or a current student, we urge you to connect to us on Facebook (UK Natural Resources and Environmental Science) and LinkedIn (University of Kentucky Natural Resources and Environmental Science Program), and join our groups.

We look forward to reconnecting with you!

If you have news you would like to see included in the newsletter, or other comments or information, please email me at marthur@uky.edu. We aim to keep you informed of our activities and engaged in our students’ success.

Dr. Mary Arthur
Get Social with NRES!

NRES is now on Facebook, LinkedIn, and Instagram! We invite you to follow our social media feeds for up-to-date information about the NRES program, photos of student activities and travels, current student and alumni highlights, as well as weekly job and internship announcements. On LinkedIn, we've created a group for current students and alumni to increase the ability of graduates to network within the industry. Search LinkedIn for the University of Kentucky Natural Resources and Environmental Science Program to join our network. NRES is on Facebook as “UK Natural Resources and Environmental Science” (www.facebook.com/KentuckyNRES), and you can find NRES on Instagram: @kentuckynres.

We invite you to share your photos and news with us as well! Send us your photos from the field or links to job announcements that you think NRES students should know about. Feel free to contact us through Facebook or LinkedIn. You can also reach us by email at NRES@uky.edu.

10 Job Search Tips from a NRES Alumnus

**NRES graduate, Eric Hope, offers tips for breaking into the job scene**

**Tips for Searching and Applying**

1. Don't be afraid to apply to everything you have an interest in, even if the position seems somewhat out of reach.

2. If you're looking to break into federal wildlife positions, it can be challenging due to a preference for veterans and applicants with a master's degree or higher. Eric has found success in seeking paid and/or AmeriCorps-sponsored internships, while continuing the job search on USAjobs.

3. For federal job applications, it's important to update and tailor your resume to each position to which you apply, even if the positions have similar job titles. Though tedious, applicants should list every possible skill or experience from previous jobs that are relevant to the application because the federal application process counts experience very literally.

4. Another resource that is far less known, suggests Eric, is the volunteer.gov website. There are internship opportunities that are often paid and/or AmeriCorps-sponsored which appear to be listed nowhere else. It includes listings with all federal agencies as well as several state agencies.

5. American Conservation Experience offers a lot of positions, many focused on manual labor; however, the variety is increasing. Eric suggests this organization can be less complicated to navigate than The Student Conservation Association program application. It is worth searching both resources for opportunities.

6. If you're searching for an opportunity, it pays to look often at your job search resources because many positions are posted for only a short time.

7. The Texas A&M University job board is a great resource, and a lot of people know about it. It is good to realize that the competition for opportunities posted there could be quite high.

8. If you find an announcement of interest, apply quickly. Posts can close sometimes within a week.

9. Once you've applied for a job, follow up and stay in contact with hiring managers about the timeline for choosing a candidate for a position.

10. Use your network. References can go a long way to helping you land the job you want. Reach out to let your network know what you're looking for and where you're applying.

**Internship and Employment Resources**

- TAMU Job Board: www.wfscjobs.tamu.edu/job-board
- American Conservation Experience: www.usaconservation.org
- Student Conservation Association: www.thesca.org
- USAjobs.gov
NRES students may recognize Dr. John Cox as the professor of Conservation Biology (FOR 230), but few are familiar with his diverse background related to wildlife ecology and conservation biology. Dr. Cox completed his undergraduate degree at Morehead State University with a major in biology, a minor in chemistry, and a plan to pursue medical school after graduating. However, he soon recognized his true passion for conservation biology and decided instead to pursue a master’s degree in biology at Morehead State University. For his master’s he researched the hybridization of coyotes and feral dogs, and found that, “about seven percent of unknown canine specimens collected from road kills and trappers were considered coyote-dog hybrids; a number likely lower today now that coyotes are well-established and abundant in the state.”

After completing his master’s degree, Dr. Cox worked as a wildlife technician for the Kentucky Department of Fish and Wildlife Resources. His work involved trapping ruffed grouse and white-tailed deer and moving them around the state to less populated areas. This work inspired him to pursue a PhD in Animal Sciences at the University of Kentucky. Dr. Cox researched the ecological relationships between reintroduced elk, white-tailed deer, and coyotes in eastern Kentucky. He found that coyotes opportunistically feed on elk and that white-tailed deer and elk habitats often times overlap. In 2008, Dr. Cox stepped into his current position as Assistant Professor of Wildlife and Conservation Biology after his PhD advisor and dear friend, Dr. David Maehr, passed tragically in a plane crash while tracking black bears in Florida.

In addition to teaching Introduction to Wildlife Conservation (FOR 101) and Conservation Biology (FOR 230), Dr. Cox is still very involved in wildlife research and has thirteen graduate students performing a multitude of projects under his guidance. These projects include research on black bear spatial ecology, white-tailed deer survival rates, copperhead and rattlesnake ecology, nesting behaviors of the common raven, and the impacts of chytrid fungus on salamanders in southeastern Kentucky. Dr. Cox is passionate about his research, particularly where it creates knowledge that could affect the survival of endangered species.

One of his most exciting new projects involves estimating leopard and lion populations in a wildlife preserve in Kenya, Africa with help from recent NRES graduate and Kenyan citizen Stratton Hatfield. Stratton is using motion sensing cameras to estimate populations in the Mara Naboisho Conservancy. Together, Dr. Cox and Stratton’s work will aid conservation efforts in the region, where poverty, disease, and overpopulation are compounding conservation biology problems.

For any students interested in pursuing a career in wildlife conservation, Dr. Cox recommends working with an advisor to structure your coursework to become eligible to apply to The Wildlife Society for a certification as an Associate Wildlife Biologist. He explained, “a Certified Wildlife Biologist or proof of meeting the minimum coursework requirements is required for some wildlife positions, including those in Kentucky.”

If you have any further questions, talk to your advisor or email Dr. Cox at: jjcox@uky.edu
Non-traditional Student Highlights:

By: Jad Husayni

**Chris Goddard** enlisted in the U.S. Marine Corps shortly after graduating from high school in Owensboro, KY in 2004. Chris’ decision to join the Marines was both personal and financial, since the GI Bill would pay for a college education upon completion of four years of service. After more than six months of basic and secondary training, Chris was shipped to Iraq for seven months as an infantryman during his first tour of duty in 2005. Chris served a second tour of duty in Iraq the following year, this time spanning nine months, and returned to the states in 2007. By the time he was discharged in 2008, Chris had been promoted to sergeant.

With his military contract complete, Chris set his sights on obtaining his undergraduate degree. He enrolled at Bluegrass Community and Technical College (BCTC) in the fall of 2008 and graduated with an Associate’s of Science degree (see BCTC article, page 12), and then enrolled at UK in 2011 as a civil engineering major. However, he soon realized that environmental science was his true passion and quickly changed his major to NRES, a decision he said was strongly influenced by time spent hunting and fishing as a child. Chris performed his first of two internships during the summer of 2013 with Century Aluminum in Hawesville, KY, where he worked as an environmental technician and tested air, water, and solid waste emissions from the aluminum production process.

Chris’ second internship arose from an idea he had while standing at a bus stop during winter 2013. As he stood there, his body numb with cold, he began to envision ways to let students “feel” the effects of solar energy. He then took his idea to the UK Office of Sustainability (http://www.sustainability.uky.edu/) and, after some research, proposed that UK create bus stops with solar panels to provide heat in the winter, power cooling fans in the summer, and add extra electricity to the grid during peak sunlight hours. His idea was recently awarded a Sustainability Challenge Grant to the University of Kentucky Center for Applied Energy Research. The first prototype is expected this fall. As a result of his creativity, Chris was awarded an internship with the Office of Sustainability to promote solar power on UK’s campus. Chris was successful in proposing the addition of two solar panels on the Ralph G. Anderson Building on UK’s campus, a project that will be funded by UK’s Physical Plant Division and is projected to provide thirty kilowatts of energy per year.

Today, Chris looks back on his achievements with pride. The military taught him the structure, self-discipline, and commitment necessary to achieve his goals. In addition, it taught him to make education a priority, which he says helped him through challenging classes like Forest Ecology and Conservation Biology. His advice for current students is to “view every class as an opportunity to learn something that will benefit you in the future, no matter how minimalistic it may seem. Do not take your education for granted.”

The NRES program benefits greatly from servicemen and women like Chris because their demonstrated leadership abilities serve as a positive example for younger students in the major. Thank you for your campus leadership, Chris!
NRES Salutes the Students That Served

James Stermer is not your average college student, and the forty-something veteran has the background to prove it. Growing up as a military child, James moved to different military bases every three years, including two bases in Germany. He had little exposure to other career paths, so when he graduated from high school James joined the armed forces. Over the course of the next decade James worked as an electronics technician for the Navy where he maintained and repaired everything from air search radar systems to satellite communications technology. In 1999, he left the Navy ranked an E5 Petty Officer Second Class and transferred to the Army for the opportunity to continue expanding his skillset. During his time in the Army, James served as a Scout team leader and served two tours of duty: in 2006 in Iraq and in 2008 in Afghanistan. Following his second tour of duty James transferred once again, to the Army Reserves, to pursue his goals for a career path outside of the military.

James enrolled at Bluegrass Community and Technical College (BCTC), graduating in 2013 with an Associate’s Degree in Science and Environmental Science Technology. Shortly thereafter, James decided to further his education in the NRES program. Thanks to the BCTC/NRES combination program, much of his coursework from BCTC transferred to UK and NRES with ease, allowing him to complete his NRES degree in only two additional years (see BCTC article, page 12).

James’ focus areas are Field and Laboratory Analysis and Soil Science. He is also a member of the UK Soil Judging team, the same team that gained a berth in this year’s National Collegiate Soil Judging Contest, to be held at University of Arkansas-Monticello on April 19-24. In addition, James will be conducting research this summer on residential bodies of water under the guidance of Dr. Chris Matocha. Many homeowners add copper to their private ponds to make the water look bluer, but the added copper settles out over time and could have a negative impact on the underlying soil. His research will determine the fate of the copper and how it affects soil and water quality. James will graduate this December with plans to test the job market before contemplating graduate school. In the long term, his goal is to return to Germany and work on environmental remediation projects on former US military bases.

When asked to reflect on his experience as a non-traditional student, James summed it up with one sentence: “I had an absolute blast.” Not only did he gain valuable skills and knowledge, he also made lasting friendships and unforgettable memories. James credits his time spent in the military to his successes in NRES because it forced him out of his comfort zone and taught him to prioritize his goals, which ultimately allowed him to take full advantage of the educational opportunity at hand. James’ success as a non-traditional student demonstrates that success in the NRES program can be achieved regardless of age, background, or prior educational experiences.

Pictured above (from left to right): James just after returning from his second tour of duty in the Army, 2008; James prior to a military funeral, 2012; James holding a black racer snake at Robinson Forest, summer 2014. Photo credits: James Stermer
Several NRES students participate in educational experiences abroad each semester. We asked NRES student Caroline Engle ('16) and recent graduate Sarah Barney ('14) to highlight their adventures and reflect on what proved to be life-changing experiences abroad.

By: Caroline Engle

Two Weeks in Peru with Caroline Engle

When I first arrived at the University of Kentucky I never imagined that the opportunity to attend a United Nations conference was a possibility. However, after talking to a NRES alumnus, Patrick Johnson, I realized that I could make that dream a reality. Two years later I was selected to serve on the 2014 Sierra Student Coalition International Committee Delegation to attend the United Nations Framework Convention on Climate Change (UNFCCC) Conference of the Parties (COP) in Lima, Peru, in December 2014. The Student Sustainability Council, the Tracy Farmer Institute, the College of Agriculture, Food, and Environment, and the NRES program provided financial support for me to represent the University of Kentucky at the conference.

For the last 20 years, the UNFCCC has hosted the COP to develop a treaty to comprehensively address anthropogenic climate change. The COP process produced the Kyoto Protocol in 1997, but a new agreement must be adopted by December 2015 when the Kyoto Protocol expires. As a result, COP20 (the 20th COP) paved the road for the new climate agreement by unveiling intended nationally determined contributions, or individual carbon reduction goals set by each country, aimed at a low-carbon, climate-resilient future.

As a NRES student with emphasis in Policy Analysis and Water Resources I went to the conference with a well-developed passion for international environmental policy regarding Loss and Damage (policies focused on countries particularly vulnerable to climate change disasters) and REDD+ (forestry initiative to enhance carbon sinks), but walked away from the conference having learned much more. At the conference I talked to climate change experts, wrote blogs, interviewed youth from around the world, made a formal presentation to Chinese government officials, and met with U.S. policy leaders. Many of the conversations I had, both inside and outside the conference, altered the way I view climate change issues in a powerful way. For example, I talked to youth from small island states who are engaged in developing policy regarding their countries’ future expected mass migration resulting directly from climate-induced sea level rise. In the face of their plight and that of their cultures, I truly felt the urgency of climate change for the first time as an environmental justice issue. It was an eye-opening experience to understand the personal costs of the destruction felt by communities in the Philippines, for example, whose families have been drastically impacted by super storms while the United States continues to block international discussion regarding ambitious carbon reductions by Annex 1 (developed) countries.

Studying policy as a NRES student provided me with foundational tools to analyze the multifaceted issue of climate change on a global level. My involvement in COP20 better prepared me for life after college by allowing me to discover my desire to engage with domestic energy policy. I plan to continue working with the Sierra Student Coalition in preparation for COP21 to pressure our nation’s leaders to act on climate policy. I encourage students to get involved locally on climate change issues; everything that plays out on the global scale is rooted in local efforts.

Pictured above: Caroline standing outside the conference center after receiving her NGO badge (left); Caroline presenting UK Greenthumb work to Chinese government officials within the China Pavilion, discussing barriers to moving beyond coal (right).
Six Months in South America with Sarah Barney

By: Sarah Barney

NRES students all have them…dreams of experiencing the outdoors in ways most Americans can't imagine…whether it's hiking the entirety of the Appalachian Trail, getting up close with your favorite wildlife, or living at that national park you dreamed about all semester long. Inspired by my goal to live in a neotropical forest, as well as my permaculture-themed NRES and Sustainable Agriculture capstone projects, I began a search for unique opportunities to fulfill this dream, live off the land and immerse myself in tropical ecology. Of course, this took some preparation. Most of these types of organizations are trying their best with very little so they cannot offer stipends. While I began saving months in advance, don’t let this deter you as paying a lump sum for a few month stay is actually one of the cheapest ways to travel. An abundance of such opportunities exist, so I narrowed my choices by emailing past interns and volunteers for advice and by being very upfront with project leaders about my needs and expectations.

With my rough itinerary in hand, just two weeks after graduation, I was off to the coastal Ecuadorian province of Manabi to work as an intern for Third Millennium Alliance. This nonprofit organization aims to protect the rapidly disappearing Pacific Equatorial Forests of Ecuador. Nestled in the side of a forest-covered mountain, I lived and worked with seven other interns in a treehouse-style bamboo house. Each morning I arose to the hoots and hollers of the resident Mantled Howler Monkeys, the species of choice for the ecology interns to track and identify. While they roamed the protected area in search of primates, I tended to the developing agroforestry plot and carried out projects to enhance the self-sufficiency of the research station. As interns, we also attended daily workshops and received official Permaculture Design Certifications at the end of our two-month stay.

Meanwhile, I continued to search for opportunities to experience tropical agriculture and its often opposing force: forest conservation. The stars seemed to align when I next found myself working at Wayra Sacha Farm. There, a Peruvian family with a passion for organic farming runs an ecotourism and butterfly conservation operation on the border of a newly-claimed protected area. I spent my final two months volunteering at the most remote eco-lodge in the Amazon. At the Tambopata Research Center I continued the efforts of a long-term study (Tambopata Macaw Project) that monitors macaw and parrot populations in the region. The connection of the Center to a successful ecolodge made for opportunities to interact with tourists, scientists and locals. As this was my first experience handling wildlife, my field methodology repertoire expanded dramatically. I learned to climb emergent canopy trees in search of nesting macaws and woke up at four AM to beat the birds to their daily salt-eating ritual at the claylick.

The extra effort to find meaningful experiences while following my urge to travel landed me with a variety of valuable conservation-related skills. While I learned more than I could imagine about tropical forest ecology, the most important experience I brought home was working with different kinds of people. By living and working with locals who are directly affected by deforestation, the complexities of international conservation work became clear and shed light on the effects of political and economic systems on social and environmental welfare. With my sights set on a career in tropical ecology research and conservation, the adventure of a lifetime turned into the inspiration and confidence I needed to keep following my passions.

Sarah Barney is now a laboratory assistant in the Invasion Ecology Lab at the University of California, Riverside and plans to attend graduate school in Fall 2016 to become a tropical ecologist.

Pictured above: (top row from left to right) a scarlet macaw unexpectedly lands on Sarah’s shoulder at Tambopata Reserve, Madre de Dios, Peru; a three-toed sloth visits Sarah’s room in Wayra Sacha Farm, San Martin, Peru; interns and staff at Third Millennium Alliance, Manabi, Ecuador; Sarah standing next to a giant ficus tree, Tambopata Reserve, Peru; Sarah harvesting plantains and sugar cane at Wayra Sacha Farm; (bottom row from left to right) a view of the Tambopata Research Center from the top of a nearby artificial macaw nest; a harvest of fresh fruit from Wayra Sacha Farm; Sarah’s accommodations, a bamboo house, in Manabi, Ecuador. Photo credits: Sarah Barney
Internship Highlights

By: Jad Husayni

Rebecca Schwager

Rebecca Schwager loves everything about Colorado: the beautiful scenery, countless outdoor recreation opportunities, and a reputation for health-conscious communities. With plans to move there after graduating this May, Rebecca conducted an internship last summer with the Colorado Ocean Coalition (COCO), a non-profit organization that aims to promote environmental awareness and stewardship of our oceans, located in Boulder, CO. Rebecca has a focus area in conservation biology, and a special interest in aquatic ecosystem conservation and restoration, so interning with COCO was a prime opportunity for her to gain work experience and develop contacts in a location where she hopes to eventually build her career. Rebecca initially expected to be involved in the research aspect of COCO’s ventures, but to her surprise the organization instead asked that she arrange an entire fundraising event. With no prior knowledge or experience in event planning, Rebecca spent the summer touring venues, organizing volunteers, promoting the event, and recruiting local and national sponsors like Patagonia, Loki, and TYR, among others.

Although her internship was not what she had originally envisioned, Rebecca was happy to have gained valuable skills that are sure to benefit her in the future. For example, she learned the ins and outs of running an environmental non-profit organization, honed her time-management skills, and made connections with professionals in businesses and organizations throughout the area. Rebecca described her internship as challenging yet rewarding, and it left her wanting more of what Colorado has to offer.

Pictured above: Rebecca and her supervisors at COCO’s fundraising event, Boulder, CO. Photo credits: Rebecca Schwager

Philip Shutler

Ten years from now Philip Shutler hopes to be working as a geographic information systems (GIS) analyst in Washington, D.C. To build toward that goal, Philip conducted his internship last summer as a GIS Surveyor at Hidden Pond Nature Center; a small 25-acre natural area nestled among the neighborhoods of Fairfax, VA, just outside of D.C. Philip’s day-to-day responsibilities included updating the trail map, designing new trail systems, and surveying the fish and invasive plant species in the park.

To conduct his plant survey, Philip used GPS units to collect data on the location of invasive plants throughout the park. He then entered the data into the ArcGIS computer program to generate density maps that illustrated their abundance. The results of his survey showed that an abundance of multiflora rose (Rosa multiflora) poses a particularly serious threat to the diversity of local plant communities. This was the part of his job that Philip found most rewarding because it marked the first time the park had assessed their invasive species problem. In addition, the nature center published his findings and maps to their website for public use. Philip is confident his research experience will serve as a great stepping-stone into a career in GIS Analysis.

Pictured above: an excerpt from Philip’s plant survey taken at Hidden Pond Nature Center, Fairfax, VA. Photo credits: Philip Shutler
Shelby Fulton

Shelby Fulton (’15) conducted research with Drs. Luke Dodd and Lynne Rieske-Kinney examining the importance of riparian habitats to bats in urban areas. During the summer of 2013, Shelby conducted fieldwork at McConnell Springs Nature Park and Veteran’s Park, both in Lexington. Shelby monitored bat activity in the parks by hanging detectors that record echolocation calls, while simultaneously catching insects using black light traps to measure their abundance. During the fall semester Shelby analyzed and interpreted the data she had collected and presented her findings at the Kentucky Academy of Sciences Conference in November 2013 at Morehead State University. Shelby found her research experience to be extremely rewarding, culminating in a summer internship studying bat populations at Mammoth Cave National Park in 2014.

Michelle Gilmore

Over the course of her sophomore, junior, and senior years, Michelle (’14) conducted independent research under the guidance of Dr. Andrew Stainback. Using data from the online and freely available Forest Inventory and Analysis National Program, Michelle computed transfer values, acreage values, and carbon sequestration amounts to estimate the monetary value that Kentucky’s ecosystem services provide on a per acre basis and for the Commonwealth as a whole. She compiled her results into a presentation for the National Conference for Undergraduate Research (NCUR) held at UK in April 2014. Her findings were published in NCUR’s proceedings journal in the fall of 2014, something Michelle says really stood out on her applications for graduate school. Michelle is now working on her Master’s Degree in Energy and Environmental Analysis at Boston University.

Shane Stiles

Shane Stiles (’16) wanted the opportunity to expand his knowledge outside of the classroom, so last spring he approached Dr. Mary Arthur with the desire to conduct research over the upcoming summer. Dr. Arthur referred him to Dr. Margaret Carreiro, an Associate Professor of Ecology at the University of Louisville, who arranged for Shane to work as a research assistant for one of her graduate students, Eric Moore. Eric’s work involved a follow-up study of invasive plants in Cherokee Park, located in Shane’s hometown of Louisville, KY. Each day the pair recorded the prevalence of invasive and native plants within 25 meters of previously established sites. Shane’s participation greatly expanded his knowledge of plant taxonomy and ecology, and it inspired him to pursue a career in botany or ecology. Furthermore, it introduced him to professionals in the field and offered him valuable insight into graduate degree programs, which Shane says made his experience extremely worthwhile.
Alumni Highlight:

Beverly James

By: Jad Husayni

Each fall students taking Forest Ecology are introduced to Beverly James, Preserve Manager at Floracliff Nature Sanctuary, during one of their weekly field trips. Floracliff is a 287-acre non-profit, privately run nature preserve located in southern Fayette County. During their visit, Forest Ecology students are privileged to have a private tour from Beverly as she masterfully describes the ecological relationships amongst the preserve’s diverse flora and fauna, touching on subjects like invasive species ecology and management, biodiversity, and old-growth trees.

Beverly graduated from the NRCM program (former name for NRES) in 2004 with an emphasis area in Conservation Biology. As Floracliff’s only full-time employee, she has what seems from the outside to be an overwhelming amount of responsibility. The most time-consuming aspect of her job is managing the preserve’s invasive species, which requires an enormous, year-round effort. To do this, Beverly makes seasonal removal plans, prioritizes areas that need attention, and coordinates employee and volunteer removal efforts. The fall and winter seasons are dedicated to removing Amur honeysuckle and other non-native invasive species like privet, burning bush, Japanese honeysuckle, and wintercreeper. When spring rolls around, Beverly switches her attention to garlic mustard and Star of Bethlehem, followed by Chinese yam in the summer. Currently, Beverly is coordinating with other preserve managers around the state to develop a strategy to mitigate the effects of the recently arrived emerald ash borer, an invasive beetle that attacks and kills ash trees. Beverly said she enjoys this work because “it comes with immediate gratification and I often come upon new observations in the field while working on honeysuckle.”

In addition to addressing invasive species, Beverly also leads, plans, and facilitates environmental education programs that highlight Floracliff’s biodiversity. This is one of her favorite aspects of the job. She said, “I have come to really enjoy leading and planning educational programs, particularly the Floracliff Field Studies Workshops. I enjoy the creativity that comes with programming and I like interacting with visitors.” Floracliff Field Studies Workshops are hands-on workshops that educate visitors about a specific topic in depth (http://www.floracliff.org/fieldstudies.html). Workshops to date have focused on wildflowers, trees, stream macroinvertebrates, mushrooms, birds, and insects, among other topics. To add to her workload, Beverly is also in charge of stream monitoring, fundraising, managing Floracliff’s web presence, and maintaining the buildings, trails, and tools on site.

Beverly attributes her success as Floracliff’s manager to a number of prior experiences, and her experiences in the NRCM program. For example, she still employs concepts taught in courses like Forest Ecology, Dendrology, and Ornithology in her daily routines. Beverly also credits her prior work experience with providing opportunities to apply her knowledge to real-life situations in professional settings. In particular, working for the Kentucky State Nature Preserves Commission provided valuable experience removing invasive species, conducting prescribed burns, and reading survey maps to determine property boundaries, all of which are skills that are relevant to her position today.

From her experience managing Floracliff, Beverly recommends current students “get involved and network. Find organizations and groups that work in areas you’re interested in. Attend their meetings or programs and volunteer your time. Many environmental non-profits need younger people to get involved or be on their board; it can be a great way to gain experience and find out about more opportunities.”

To learn more about volunteer, internship, or educational opportunities, visit Floracliff’s website at: http://www.floracliff.org/index.html
Christina Kuchle’s professional life has been nothing short of a whirlwind since her graduation from UK in 2011 with a double major in NRES and Forestry. In the first two years alone, Christina held three different positions in three different organizations. Her first two positions were in research labs; first in an invasive plant ecology laboratory at Indiana University, and the second in a molecular and analytical chemistry laboratory run by the U.S. EPA. Today, Christina finds herself happily working as the Northwest Region Scenic Rivers Program Manager for the Ohio Department of Natural Resources, located in Finley, OH.

The Scenic Rivers Program is a partnership between communities, conservation organizations, private landowners, and all levels of government to conserve ninety-five river miles of the Maumee State Scenic and Recreational River and sixty-five river miles of the Sandusky State Scenic River, both of which are located in northwest Ohio. As Program Manager, Christina regulates all of the publicly funded projects that occur within one thousand feet of the Scenic River areas, like bridge construction, road expansions, and sewer line maintenance. In addition, she also manages the Volunteer Stream Quality Monitoring Project, a program that trains hundreds of volunteers each year to survey 150 designated stations throughout the scenic rivers and supply data for the agency’s annual Stream Quality Reports.

Being responsible for a wide variety of duties is what Christina enjoys most about her job; every day offers something different. As she explained, one day may be spent teaching kids how to collect macroinvertebrates, while another may be dedicated to learning best management practices for reducing non-point source pollution. Whatever the tasks may be, Christina credits her classes in the NRES program for providing the background knowledge to take them in stride. Environmental Policy is one particular class that she mentioned because much of her job requires knowledge and application of the National Environmental Policy Act, which allows her to make recommendations on how to mitigate the environmental effects of bridge construction, for example. She also mentioned Forest Ecology, Geographic Information Systems, Soil Science, and Dendrology as being especially applicable to her career.

Having held three different positions in fewer than three years, Christina has knowledge beyond her years when it comes to the job market. Subsequently, she has plenty of advice to provide current students preparing to embark on their own professional careers. Her first piece of advice is to get involved outside of academia while still in school, whether it is community volunteering, working in a lab, or joining a club, it will all contribute to building your resume. Her second piece of advice is to be adaptable when entering the job market. The NRES program provides the foundation for this, but having proficient skills with programs like Excel or ArcGIS will certainly help. Her third piece of advice, and my personal favorite, is to be a good communicator when applying for jobs. This means being responsive and professional when communicating with potential employers over the phone or email. In addition, it means being honest with both yourself and your employer about unfamiliar topics, and taking the initiative to better understand those topics. But, if all else fails, at least remember her final piece of advice: “As you continue on with life, always make sure to keep a positive attitude, be curious and work hard.”

To search for environment-related career opportunities in Ohio, check out their website at:

http://careers.ohio.gov/
Describing the NRES program to those who are unfamiliar with it usually requires answering a series of questions before they fully understand what the degree entails. This is somewhat expected, though, because Natural Resources and Environmental Science engages students in a wide variety of topics across diverse disciplines. NRES students could not possibly learn every aspect of environmental science, could they? Well, maybe not entirely, but what sets NRES apart from other programs is its ability to expose students to a wide array of natural resource topics during their first few semesters, and then with the flexibility of the curriculum allow those students to choose for themselves which topics to study in greater depth. This can be especially attractive to students transferring from other majors or institutions because the NRES curriculum offers a high degree of customization, allowing students to cater coursework to their particular interests. One such institution, Bluegrass Community and Technical College (BCTC), located in Lexington, makes the transition to NRES particularly easy because students that graduate with an Associate’s degree from BCTC can now transfer to UK and obtain a Bachelor of Science in NRES in only four additional semesters!

Graduating from BCTC with an Associate’s degree automatically fulfills the UK core requirements, so transfer students can skip all the general education courses that typically consume the first few semesters at UK. With careful planning, this allows students to immediately begin their NRES coursework. In addition, some classes at BCTC can be applied to the student’s focus areas in NRES, as was the case for current NRES student and BCTC graduate Kyle Howard. Kyle comes from the small town of Harlan, KY, and was attracted to the small class size in BCTC’s Environmental Science Technology (EST) program. While there, he discovered his interest in geographic information systems (GIS) and decided to pursue it as one of his focus areas when he transferred to the NRES program. His GIS coursework transferred and Kyle received GIS credit towards his Analytical Skills Development area in NRES.

Coursework aside, there are a number of other advantages to combining BCTC with NRES. BCTC is known for having small class sizes, and students enrolled in the EST program get hands-on training in a variety of field and laboratory skills. Upon completion of the program, students have skills in air pollution surveillance, analysis of water and wastewater samples, groundwater and surface water assessment, field sampling, and data interpretation. Having this prior education makes the transition to a four-year institution relatively seamless because it allows students to gain valuable experience before they make the jump to NRES. The NRES program benefits greatly from having former BCTC students because they bring a variety of skills and interests to the major, which ultimately leads to a more exciting and fruitful educational experience for everyone involved.

If you are interested in learning more about the BCTC/NRES combination program, contact Geri Philpott (NRES Academic Coordinator) at geri.philpott@uky.edu or Jean Watts (BCTC EST Program Coordinator) at Jean.Watts@kctcs.edu.
The Appalachian region is one of the most biodiverse areas in the continental United States, but intensive strip mining and mountaintop removal over the last several decades threatens this ecosystem. Coal mining has removed huge swaths of mixed-mesophytic forest: over one million acres by recent accounts. Perhaps even more tragic is that traditional reclamation projects offer little hope for forest recovery because extreme soil compaction makes it nearly impossible for trees to outcompete aggressive non-native groundcovers, which quickly stake their claim. All that remains when the mining companies disperse are deserted scrublands; with little funding or incentive for improvement, these areas often remain unforested. That is, until now.

Green Forests Work (GFW) is a non-profit organization that recognizes the economic and ecological importance of Appalachia’s mixed-mesophytic forests. Led by Dr. Chris Barton, a Professor of Forestry at UK and NRES Steering Committee member, the organization’s mission is to “re-establish healthy and productive forests on formerly mined lands in Appalachia.” The organization officially took root in 2009 as a descendent of the Appalachian Regional Reforestation Initiative (ARRI), and received funding from a grant from the Appalachian Regional Commission. Since its inception and with the help of more than nine thousand volunteers, GFW has planted over 1.2 million trees on two thousand acres of formerly mined lands. In 2014 alone the program supported the planting of 225,000 trees and received help from 1,941 volunteers, many of whom were students from nearby colleges and universities. NRES students from UK have played a major role in GFWs success, serving as volunteers, interns and paid employees.

GFW adopted its reforestation techniques from ARRI’s Forestry Reclamation Approach, which is a set of procedures designed to provide the site conditions necessary for successful tree establishment and growth. The first step is to mitigate the onslaught of exotic species by applying herbicides and/or removing the vegetation mechanically. Next, a bulldozer pulling a 3-5 foot ripping shank spans the area and churns the soil to reduce compaction and improve soil conditions for root development. Then comes the planting of tree seedlings, carried out by trained volunteers and paid professional tree planters. After some time, a follow-up assessment is performed and additional actions are taken if deemed necessary. Once the seedlings take hold, the environmental benefits begin to show. Water infiltrates the soil better, which reduces runoff and the potential for flash flooding downstream. Decaying leaf litter creates organic-rich humus and topsoil, improving soil fertility while also filtering runoff. In addition, endangered species like the Indiana bat will benefit from the early-successional forest because it reduces forest fragmentation and provides native habitat.

GFW offers numerous benefits that go beyond the scope of the environment, too. It provides the opportunity for community involvement through volunteering, establishes a source of income in economically depressed regions through site preparation, seedling establishment, planting, timber production and professional forest management, and raises awareness about the effects that mining has on local communities. GFW is the only organization of its kind in the Appalachian region, and with such positive results and countless acres of unforested mine lands, the program is set for unprecedented growth in the coming years. With the continued help of students, conservation organizations, and surrounding communities, GFW can restore Appalachian forests to their previous splendor, one tree at a time.

For more information about GFW or how to volunteer, visit their website at: http://greenforestswerk.com/

Pictured above (right): Recent NRES graduates Nic Williamson and Sandy Broadus plant a tree on a former mine site in Pike County, KY.

Photo credits: Dr. Chris Barton
Campus & Community Sustainability

Tracy Farmer Institute for Sustainability and the Environment

By: Jad Husayni

Mission statement:

To improve built, managed, and natural environments thereby enhancing the health and well being of Kentuckians and the global community by promoting sustainable development, sound energy policies, and effective environmental stewardship through an integrated trans-disciplinary program of fundamental and applied research in the physical, life, economic, and social sciences through education as well as public service and engagement of all stakeholders. (TFISE website: http://tfise.uky.edu/)

The Tracy Farmer Institute for Sustainability and the Environment (TFISE) is a University-wide organization whose primary goal is to provide innovative approaches to confronting one of today’s most pressing societal issues: how to sustainably produce, distribute, and consume the food, energy, and water necessary to support our increasing global population. The TFISE was created in 2009 and receives financial support from the Vice President for Research Office, in addition to a financial endowment from Lexington-area horseman, banker, and entrepreneur Tracy W. Farmer, from which the institution got its name. To achieve its goal, the TFISE develops and supports working groups from a variety of disciplines across campus that perform research projects and develop solutions to problems associated with our food and water systems, the urban/built environment, and many more. In total, working groups consist of faculty and students from 14 colleges and over 45 departments across the University, illustrating TFISE’s collaborative efforts to tackle a multitude of interrelated natural resource issues. The long-term intention for working groups is to develop expertise in their specific areas and serve as a resource for the campus and local communities, as well as the general public.

One way TFISE interim Director Rebecca McCulley, an Associate Professor in Plant and Soil Science, provides a platform for working groups to highlight their accomplishments is by hosting an Annual TFISE Research Showcase. This year’s showcase, held on December 1 at the Hilary J. Boone Center on the UK campus, included an undergraduate and graduate poster competition in which three NRES students or alumni participated: Mariah Lewis ('15), Karyn Loughrin ('14), and Nic Williamson ('13). Karyn’s project, funded by a 2013 Student Solutions for Sustainability Grant from TFISE, entailed handing out energy-efficient light bulbs to students who might not normally buy them due to their higher price, and then surveying the students to predict their future energy consumption habits. Mariah and Nic are working with Drs. Mary Arthur and Lynne Rieske-Kinney on a project to illustrate the ecological, social, and economic benefits of increasing UK’s tree canopy coverage (see related article on page 15). This project, termed the Urban Forest Initiative, was one of seven winners chosen for a 2014 Sustainability Challenge Grant, a new grant program supported by multiple entities on campus, designed to promote sustainability while simultaneously advancing economic vitality, ecological integrity and social equity, now and into the future. The TFISE is an integral part of UK’s ongoing commitment to increasing sustainability, and the diversity of projects ensures that anyone from the UK community can contribute to achieving this goal.

For more information on how to get involved with the TFISE, visit their website at: http://tfise.uky.edu/About_Us

Karyn Loughrin

Nic Williamson
The Urban Forest Initiative (UFI) is a collaborative working group of the Tracy Farmer Institute for Sustainability and the Environment established in fall of 2014. The goal of UFI is to work across academic departmental and university operations, as well as with stakeholders in the Lexington community, to enhance the urban tree canopy on UK campus and in the greater Inner Bluegrass Region. The members of this group, representing a wealth of expertise and interest, have begun identifying projects, including bolstering UK’s status as a Tree Campus USA and fostering a unique urban forestry plan around one of the newly constructed buildings on campus.

Outreach and education are two major components of UFI, and several projects are in the works. First is an Adopt-a-Tree program that allows groups or individuals to highlight trees that have special meaning or enhance their lives in some way. This project is gaining traction with local middle- and high-schools, as well as the UK Eco-Rep Program, which is another campus sustainability group led by NRES students. Adoptions are shared via social media, creating a community of “treekeepers.” Second, in collaboration with the UK GIS Campus Support Group, an upcoming interactive map will calculate ecosystem service benefits (stormwater interception, energy savings through cooling and wind protection, carbon dioxide sequestration) provided by trees in close proximity to individual UK campus buildings. Finally, a segment called “Tree Stories” will explore and narrate urban forest tales (tall and small) from around UK campus. Stories will dig deep into the historical photography archive to explore UK trees of the past in conjunction with contemporary urban forest research and modelling applications.

To learn more about the UFI, contact the working group at UKnTrees@uky.edu. To read the Tree Stories and other related news, you will soon be able to visit the new website at: https://ukntrees.ca.uky.edu/.
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 a Professor of Forestry whose research focuses on stream restoration following disturbance such as agriculture, mining and logging.

Dr. Brian Lee is an Associate Professor of Landscape Architecture and his work applies geospatial analyses to watershed-based land use planning.

Robert Paratley is the curator of the UK Herbarium and he teaches 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 Associate Professor in Biosystems & Agricultural Engineering. Her research focuses on ecosystem restoration as it applies to streams as well as stormwater management.

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

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

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