

Otterbein University

## Digital Commons @ Otterbein

---

Life Line - The Biology Department Newsletter

Biology and Earth Science

---

2-2019

### Life Line - February 2019

Otterbein University

Follow this and additional works at: <https://digitalcommons.otterbein.edu/lifeline>



Part of the [Animal Experimentation and Research Commons](#), [Biology Commons](#), and the [Plant Sciences Commons](#)

---

#### Recommended Citation

Otterbein University, "Life Line - February 2019" (2019). *Life Line - The Biology Department Newsletter*. 6. <https://digitalcommons.otterbein.edu/lifeline/6>

This Book is brought to you for free and open access by the Biology and Earth Science at Digital Commons @ Otterbein. It has been accepted for inclusion in Life Line - The Biology Department Newsletter by an authorized administrator of Digital Commons @ Otterbein. For more information, please contact [digitalcommons07@otterbein.edu](mailto:digitalcommons07@otterbein.edu).

# Life Line

Volume 20

Published by Otterbein University Department of Biology and Earth Science

February 2019

## Curricular Changes for the 2018/19 Academic Year

So much to highlight in this year's achievements and happenings! In particular, this year marked the launch of the new three-credit curriculum at Otterbein. In the past, our alumni will remember that most Otterbein courses were worth four credits with students taking four classes per semester. With our recent transition, most classes are now worth three credits (classes with labs = 4 credits), and students are taking five per semester. Our curriculum remains rigorous, main-

taining the core foundational courses that, depending on major, include: Introductory Biology, General Chemistry, Genetics, Ecology and Cell Biology. We've made some adjustments with seminar, upper level and support course requirements to reduce the overall size of the majors. This increases flexibility for students and ensures that there is plenty of room to pick up double majors and minors. We know our students are interested in many programs that can complement their science coursework

(Math, Psychology, Business, Sustainability Studies, Education, etc.) or let students pursue other creative interests (Art, Dance, Music, etc.). The curricular changes also better allow students to participate in exciting internships, study abroad and undergraduate research. As you can see from perusing this newsletter, our students more than excel at these and other Five Cardinal Experiences!

*Dr. Sarah Bouchard,  
Professor and Chairperson*

## Sabbatical Takes Flight

I spent my sabbatical chasing parrots, from the field to drawers of dead birds in a museum! The Cape parrot, endemic to South Africa, was recognized as a separate species from the grey-headed and brown-necked parrot in 2017. This was overseen by Nigel Collar at BirdLife International, and was based on variables such as a description of vocalizations and plumage coloration, but very little quantitative research. I've been working with the Cape Parrot Project to study this species, so I decided to collect more measurements! I obtained a grant from the



Dr. Young, Mallory Fox and Eileen Connon

Eppley Foundation for Research, and the Biology and Earth Science Faculty Research Fund, to support travel for myself and two Zoo and Conservation Science majors, Eileen Connon and Mallory Fox. We spent over a month driving through South Africa recording vocalizations of Cape parrots, and the few grey-headed parrots we could find in Kruger National Park. We saw plenty of other amazing wildlife along the way, including a honey badger, ground hornbills, and even a Martial eagle eating an impala! Then I was off to The Gambia in West Africa to look for the brown-necked parrot. Unfortunately their population numbers have declined drastically. I spent almost a week with guides searching small forest patches and talking to locals for clues as to where the parrots were. Finally, at the end of my trip, we found a small flock flying over a park, and I obtained some rare recordings. Lastly, I flew to the UK with professors Dr. Joan Esson (Chemistry) and Dr. Steffanie Burk (Equine Science) to explore a potential



Dr. Young measuring a parrot specimen

travel course offering. Eileen joined us at the Tring Natural History Museum to collect data for her Honors Thesis. We had just a few short days to measure nearly 100 parrot specimens and collect spectrometry data, but we got it done and were even able to meet Nigel Collar while he was also visiting the museum! We'll be using these data to weigh in on the practice of using avian vocals, coloration, and body morphometrics in delineating species.

*Dr. Anna Young,  
Associate Professor*

## Coal, Gas and Oil; Environmental Geology's Trip to Eastern Ohio

This fall, Dr. Kevin Svitana's environmental geology class traveled to Eastern Ohio to visit active coal mines, reclaimed and non-reclaimed strip mines, shale gas production sites and a hydrocarbon fractionation plant. The day was hosted by Matthew Puskarich '88, Westmoreland Coal Company and MarkWest Energy Services.

The class left Westerville early and traveled to Cadiz, Ohio (Harrison County). We were met by Mr. Puskarich at the Cravat Coal Company's offices where the students were treated to doughnuts and coffee. Our host provided the history of his family's mining and the coal industry in Harrison County. We then traveled to the offices of Westmoreland Coal Company where we heard an



The truck in the center is loading ANFO into drill holes in preparation for rock blasting

overview of the company's coal mining operations and took an extensive tour of their surface mine north of Cadiz. Students were shown a close-up view of the mining operation.

The class was treated to a delicious lunch at the Harrison County library and Coal Museum. While exploring the museum we were able to



Students observe blasted overburden being loaded to move it from the working face

appreciate the rich history of coal mining in Harrison County and its impact on the area's culture.

In the afternoon we toured the MarkWest Energy Services (a division of Marathon Oil) hydrocarbon fractionation facilities. During the tour we learned how gas and hydrocarbons from the area's hydraulically fractured wells,

targeting the Marcellus and Utica shales, are fractionated into specific hydrocarbon compounds. Those are transported from the facility for use as fuels and feedstocks for other products. Students were impressed with the facility's production automation and railcar loading operation.

The day provided a wonderful opportunity for students to connect geology, environmental protection and hydrocarbon production techniques firsthand. They were able to hear "the other side" of these industries from professionals who work with the challenges of meeting energy needs, minimizing environmental impacts and providing resources for the local community. We would like to thank Matthew Puskarich for organizing this excellent learning opportunity.



At MarkWest's fractionation facility propane is stored in white tanks pending shipment offsite via rail

## Back to the Little Miami River

On April 23, 1969, the Little Miami River became Ohio's first State Scenic River. To celebrate the 50-year anniversary, the Ohio Department of Natural Resources will fund a new study of the mussels of the Little Miami system. I say a new study, because Little Miami Incorporated and the Scenic Rivers program in Ohio have done this before: first in the summers of 1990/1, then again in the summers of 2006/7, and now again

this coming summer. The first survey found the river system supported 36 species of mussels including five species listed as endangered in Ohio and one species listed as a federal endangered species. The second survey found that the mussel fauna had declined in the river's tributaries (especially Todd's Fork and Caesar Creek) and that some new species had found their way into the mainstem of the river and the East Fork upstream

of the impoundment. In addition, we found that two introduced species (Asiatic clams and zebra mussels) had entered the system. This summer, Dr. Hoggarth along with two students will collect from the same sites that were sampled in 2006/7. In addition, we will be on hand when a low-head dam will be removed and will help to salvage mussels from the dry impoundment and move them to safety. It should be a fun summer on a great Ohio River!



## Wild Heritage! Engaging the Community in our Natural History

This past summer, thanks to the Otterbein Five Cards Program, and the amazing faculty in the Otterbein Biology and Earth Science Department, I, Rebekah Perry '18, was able to start a program that helped launch my entire career. Heritage Farm Museum and Village is an Appalachian History Museum in Huntington, West Virginia, started by my Grandfather in 1973. The farm has always been a destination for lovers of history and Appalachian culture, but part of our dream for the future is to add programming and facilities that will allow people to explore the natural history of Appalachia and engage in its conservation.

I created Wild Heritage outdoor education programming. My goals for the program were to excite the Huntington Tri-State community about what is in their own back yards, instill an interest in conservation within people of all ages, and to plant the seed for Heritage Farm Museum and Village to expand its current programming to include Natural History attractions

permanently.

Throughout the summer, over 2500 people participated in Wild Heritage activities, such as: birding and nature walks, bat box building, making recycled bird feeders, owl pellet dissection, tree identification, pollinator garden planting, creek play days, scavenger hunts and more! Also, over 18,000 people viewed my Facebook Live Video Series that focused on different animals each week. Needless to say, the project was a great success. My faculty advisor, Professor Casey Tucker, introduced me to an Educational Partnership Grant through BirdNote, a conservation storytelling organization. Using the skills that I learned at Otterbein, I applied for this grant and was awarded \$3,000 for Wild Heritage outdoor education programming to continue through 2019. I look forward to utilizing these funds to host more nature walks, host 'critter camps' for young children, offer opportunities for local students to engage in field conservation projects, and to continue providing engaging educational experiences for all ages about the Great



Rebekah building a bat box

Appalachian Outdoors! I owe much of this success story to my Otterbein education, and the many professors that helped and encouraged me along the way. I hope to see my fellow Cardinals out at Heritage Farm Museum and Village someday to experience Wild Heritage for themselves!

## Students Present Research

Emma Kimberly (right) presented her research on a woodland box turtle at Ohio Partners in Amphibian and Reptile Conservation Conference, March 20, 2018.

A woodland box turtle was brought to a wildlife rehabilitator following an attack by a dog. Damaged tissue and shell fragments were removed and a skin flap was sutured by a surgeon. The turtle was carefully monitored and kept hydrated, but it did not eat. After two months, the turtle was healing but was still not eating. A makeshift replacement of part of the turtle shell was fashioned with putty and a seashell. One week later the turtle began to eat. One month later, the seashell was replaced with a better fitting fiberglass shell fragment painted to resemble the original shell pattern.



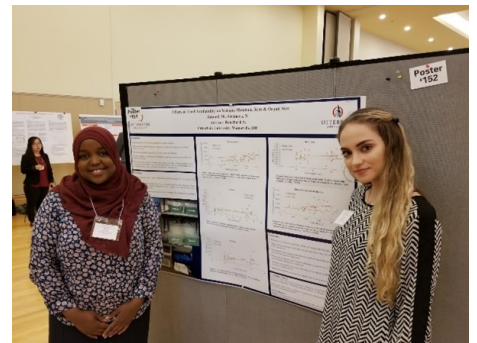
Five students presented their research projects to an audience at the Ohio Academy of Science on Saturday April 14, 2018 at Bowling Green University.

“Leaf Extracts of *Acer spp.* Cause of Different Patterns of Toxicity in Bioassays of Equine Erythrocytes” Amanda Drake '19

“Ecological Correlates with Dioecy in the Flora of a Tropical Premontane Wet Forest in Costa Rica” Breanne Held '17

“Construction of a Low Cost, Fixed Stage Microscope for Experiments in Neuroscience” Mallory Soska '19

“Effects of Population Density and Food Availability on *Xenopus* Metabolic Rate and Organ Size” Muna Ahmed '18 and Nikolina Stefanova '19 (right).



## Fem in STEM: Powerful Women Share Powerful Experiences

This fall, some students and I had the pleasure of attending the BioOhio Women in BioScience & HealthCare Conference. This was a fabulous networking opportunity, as well as educational experience, where we were able to interact with and hear the experiences of advanced professionals in the biomedical and health care fields.

Throughout the conference, speakers shared their career paths. One panel included Rozy Park of Tedia Company, Dr. Erica Conroy of CoverMyMeds, Cris LeBlanc of Xavier University, and Tracy Papenfuss, DVM, MS, PhD, DACVP, the Principal Pathologist at Charles River. They discussed their individual stories, explaining how they took advantage of opportunities that allowed them to explore alternate fields of interest. This led them to very different careers than they originally planned. They advised students and those still developing careers to take advantage of opportunities for new experiences and try things that are outside of their comfort zone.

Another panel of speakers included Jaime Fensterl, MS, MBA of Abeona Therapeutics, Suguna Rachakonda, PhD, MBA of Cleveland Clinic, and Dr. Louise Rodino-Klapac of Myonex Therapeutics. They discussed how they expanded their

opportunities and their careers using resources in their community and in their networks. They highlighted the importance of reaching out to other professionals. Not only could it help with a current research project or other position, but it can also lead to opportunities outside of your field of interest.

A panel of healthcare professionals including John Barnard, MD of Nationwide Children's Hospital, Alice T Epitropoulos, MD, FACS of The Eye Center of Columbus and The Ohio State University, Susan E. Sherman, MHA of the LAM Foundation, and Dr. David Taffany of Cardinal Health, spoke about the connection between research, the healthcare community, and marketable products. They highlighted the importance of patient input in improving care for diseases and disorders. Normally the divide between these patients and doctors can cause problems in communication. Susan Sherman talked extensively about her project to help patients with the rare disease lymphangiomyomatosis (LAM), where patients were actually able to sit down with doctors and scientists to work towards improving their lives.

Other speakers, including the CEO of COSI, Dr. Frederic Bartley, discussed how science is presented to the mainstream and specifically to

children who are minorities. He provided his perspective as an African American man. In today's society it is common for kids to aspire to be famous social media stars, sports players, or actors; but there are extensive openings for careers in the biosciences. Exposing kids early to science and research methods can spark their interest in a career path they would never think about otherwise. It is important especially for girls and children of color to have role models to be able to see themselves as scientists. Women scientists should take on mentoring positions where they can encourage the younger generation to develop their careers.

Overall, these successful women seemed to agree that their gender did not blatantly restrict them from their career path. There was a theme of confidence and perseverance among the panelists, but this was also paired with an openness to opportunities and experiences outside their immediate interests. Networking was important in all areas of a woman's career. We are very grateful for the opportunity to attend this conference as a chance to practice these networking skills and to be a part of such an important discussion.

*By Danielle Nicole Duryea '20*

## A & P Fun

In Anatomy & Physiology and Animal Systems Physiology, students engaged in hands-on experiments to learn about physiology. The goals of these laboratory exercises were for the students to apply to themselves what they were learning from the textbooks and lab manuals. Students in A&P learned first how to determine blood types with simulations and then actively engaged in their own blood typing test. In Animal Systems Physiology, students took it to the next level by developing programs and

immersing themselves in self-chosen "healthy" lifestyle activities - exercising or meditating regularly, quitting smoking, regulating salt intake, training for a 5K or half marathon, taking dance classes, and even scuba diving. Over the course of 10 weeks, students analyzed how their own physiological measurements changed over time. Most students learned that, while not always easy, being healthy is a choice that can lead to significant improvements in their "numbers" like resting heart rate,



blood pressure, muscle strength, and VO2max.

*By Dr. Dave Sheridan*



## Zoo Students on the Belize Trip Pass their Final Exam with Howling Colors

The May travel course to Belize “Understanding the Nature of Belize” led by myself and Dr. Michele Acker (Psychology) presented an opportunity for zoo and conservation science students to rise to the moment and use what they had learned in their Otterbein education. It all started the afternoon we arrived at the BFREE station deep in the Belize Rainforest. Unbeknownst to them, as a resident Howler Monkey troop moved through the compound, a baby fell from the trees and after much ado was apparently abandoned. Director Jacob Marlin heard the commotion and once the troop moved on, he investigated and found the un-weaned baby crying on the ground. Hoping that the mother would return, Jake left it alone that night. We made sure to keep the students out of the area, but we didn’t say why.

In the morning, the baby had crawled just a short ways and it was now waterlogged, limp, and listless. While Jake is an expert herpetologist, he had never had anything like this happen before and had no idea what to do. He decided to cradle up the baby and bring it to the hut where students were beginning to assemble for breakfast. He confided to the Zoo students that they undoubtedly knew more about caring for mammals than he did, and unceremoniously passed off the limp body with just the simple instructions to “try to keep it alive.” He then headed out to the radio tower to try to contact the one rescue organization in Belize that may or may not be able to do anything and may or may not be able to make it



Madison MacElrevey and Delaney Galbraith pour warm rice into a sock for the baby to hug

down from northern Belize in the next day or two. But the Otterbein students were ready to go. They immediately jumped into action calling out for a syringe and a sock!

From their rotations and volunteering at the Ohio Wildlife Center, they knew that dehydration and warmth were the two most crucial factors for distressed wildlife, and soon a syringe of warm sugar water was being dribbled into Otto’s mouth (Otto for Otterbein of course!). They then raided the pantry, heated rice grains in the oven, and poured them into a sock. This provided some needed warmth to Otto as he hugged it. Over the next several hours, Otto sipped fluid from the syringe while wrapped around the sock and cradled in a warm towel held by a loving student. His tiny fingers remained wrapped impossibly tight around the much larger finger of his surrogate parent - he was not letting go!



Stevie Cisek uses a syringe to hydrate the baby Howler held by Abigail Miley

Eventually small movements began, his eyes got a little shine, and he even managed a few guttural grunts. Students became hopeful that he might make it to the evening when the rescue organization was scheduled to arrive.

As the students cooed around Otto, I headed out to get our activities for the day in order and noticed that a couple of Howlers had come back into camp. I was watching as Otto grunted again and the closest Howler became transfixed. Over the course of several more grunts, she came closer and peered unmistakably towards the hut where the baby we were swaddling was undoubtedly hers.



Adult Yucatan Black Howler Monkey (*Alouatta pigra*) in Belize

The decision was clear, and while we knew it was going to be a long shot, we also knew we had to give it a try. I retrieved the baby from the hut, and with all eyes watching I walked a short distance into the jungle to the base of a tree near mom. With much difficulty I uncurled the tot’s fingers from my own, and felt terrible as I abandoned the wailing baby onto a clump of moss and damp dirt.

But some stories have happy endings, and this is one of them. Within a few seconds, the mom moved in and scampered down the trunk. We couldn’t actually see what was happening down in the undergrowth, but soon she was climbing back up the trunk. As she paused on a branch, we got a glimpse of her lost child (the name Otto no longer seemed relevant) who had been hidden deep in her fur. He was suckling. We all cheered. She stopped again on a higher branch for a longer feeding, and then it was time. With child clinging, mom headed out across the canopy to rejoin her troop in the jungle. Later the rescue organization would turn around mid-trip. Its services would not be needed.

*By Dr. Halard Lescinsky*



Zoo student Kevin Wirges holds “Otto” after he is mostly revived and starting to vocalize

## The Journey to Naming Ohio's Mighty Microbe

Ohio is well known as the Buckeye state. Its rolling fields are filled with cardinals, carnations and white-tailed deer which have all become official state symbols. But we noticed it was lacking something quite special, an official state microbe!

The project to find a suitable microbe began in an Otterbein Microbiology class with Dr. Jennifer Bennett as the instructor. For an assignment, students were asked to propose a microorganism and give their statement as to why their microbe should be chosen. During class time, students voted for which six should be the candidates for the

election. Soon after, they named this project MicrOhio. With the candidates chosen, the service learning began. This project gained momentum through the first community outreach event in a Fourth Friday festival in uptown Westerville. Students in the class along with Otterbein's American Society for Microbiology (ASM) student chapter planned the event. Cards were handed out to pedestrians asking them to follow the social media pages to spread awareness for the project. In addition to this effort, members of ASM also spent time talking to the people of Westerville about MicrOhio at the local library. Teachers and organizations throughout the state were also encouraged to share the project with their students, helping to spread the word beyond Otterbein's campus.

As the project grew in scope, there also grew a concerted effort to incorporate the principles of civic involvement within the mission. The voting period was aligned with the 2018 midterm election, taking on the name "Microbe Term Election". After the election took place, political

science students were brought in to help develop a resolution to propose to the Ohio Assembly. This is where the project currently stands, with the Buckeye Dragon Mite being selected as Ohio's proposed state microbe and the beginning of MicrOhio's effort to make it officially recognized.

The project began small and worked its way out to the community. Through this experience, we were able to educate the public about microbes and the essential role they play in our everyday lives. Since these creatures are so tiny, we were able to give them a voice. After all, there are 10x more microbes in and on us than human cells, making us in many ways more microbe than human.

Follow this ever-expanding project on social media.

**Facebook:**

**@Microbe4OhioOtterbein**

**Instagram:**

**@Microbe4Ohio\_Otterbein**

**Twitter: @Microbe4Ohio**

*By Bridget Bowman '20 and  
TJ Clinton '19*



## Bickers '15 Completes Studies at Cornell University

Looking back on the last four years I suppose the highlights would be participating in the Veterinary Investigator Program (VIP) the summer after my first year. I spent the summer investigating the effects of high density lipoproteins (HDL) on bovine neutrophils, which yielded data suggesting that HDL had immunomodulatory effects on bovine neutrophils that could be beneficial in preventing inflammatory diseases during the transition period (the time between the end of pregnancy and increasing lactation post calving). The next highlight would be acting as a teaching assistant for the Equine Summer College program held at Cornell the summer after my second year. I produced course materials, lectured and aided running laboratories, and held daily office hours. Working with these students may have been the most rewarding

experience I had during vet school. This past year has been dedicated to clinical training, and it's where I've learned the most. The best rotations I've had were Theriogenology and Community Practice Service. In Theriogenology the faculty were amazing teachers and I discovered an area of medicine that one day I might pursue further study in. Community Practice Service put us in the driver's seat acting as general practitioners with great faculty mentors as back up. I think the most memorable moment during clinics was having the opportunity to assist with a surgery on a black leopard! It was a privilege to be able to work with such a beautiful animal. I recently presented a case that I saw while on Large Animal Medicine, which was a two year old Quarter Horse gelding who presented for severe anemia as part of a pancytopenia (drop in all blood cell



lineages) that we unfortunately diagnosed with acute myeloid leukemia. This is a very uncommon disease in horses, so I selected it as the topic of my senior seminar to present to the vet school community. I am wrapping up my clinical year and will be graduating as a Doctor of Veterinary Medicine at the end of May, and then hopefully will be returning to Ohio to practice.

*By Bridget Bickers '15*



## Students Excel at Scientific Art

Having the opportunity to help host Otterbein's Inaugural Scientific Art Show was a fun and rewarding experience. Being a member of Otterbein's student chapter of the American Society for Microbiology (ASM), as well as a student in Dr. Bennett's Microbiology class and research lab allowed me to organize the show from multiple perspectives. It also allowed me to use knowledge that I have gained in these classes and extracurricular activities and apply it to presenting science to others with and without science backgrounds.

This art show stemmed from the microbe art competition that was held last year in Dr. Bennett's microbiology class. We continued that idea this year, but extended it to other departments. As students in the class, we had to streak different species of bacteria on several types of media that we had learned about. Certain media were



chosen to select for certain bacteria or highlight characteristics of that bacteria. The plates were then incubated, and the students were responsible for knowing at what temperature their bacteria grew best and for how long.

Several ASM members were very helpful and this art show truly was a team effort. Once picture files were received, we sent them to the copy center. Getting the images ready for display took about two nights of students coming together, cutting poster board and images, and finally, pasting the images on to the poster boards. Then we printed and cut out all the title pieces and matched them with the correct artwork. Being able to see all the work come together at The Point made it all worthwhile. During the show, tablets were available for visitors to vote in the People's Choice Award in the categories of Microbe Art, Nature Photography, Drawing and Sculpture, and Microscopy Art. The prizes for winners were Giant Microbes, stuffed renditions of our fellow microbes, and gift cards. I won third place for the Microbe Art Category and received a Rhinovirus, also known as the common cold. The Inaugural Scientific Art Show was very successful as we had a total number of 100 votes and many more visitors. This year four departments were



involved: Biology and Earth Science, Chemistry, Physics, and Art all submitted a combined total of 93 submissions. Students from the Department of Art also helped with the show. Next year, the Engineering and Computer Science Departments asked to be involved.

Even when presenting artwork to peers who have a science background, there is still such a wide variety of work. It was interesting to see work outside of microbiology such as the wildlife photography and artwork. In addition, it was rewarding to present all of our plates from the microbiology class. When people hear about microbiology and research done in the Bennett lab, it can sound complicated, but being able to visually show people how dynamic and beautiful microbes can be helps the purportedly abstract idea seem simple.

*By Erin Orr '19*

## Room 112 Facelift Paves Way for new Aquariums

The 200 gallon saltwater reef tank visible in the downstairs hall of the Science building will soon have company. Across the hallway, Dr. Lescinsky's project lab (room 112) has been renovated to allow the installation of numerous tanks to support the Zoo and Conservation Science Program's new Aquarium Track. The renovation involved removing cabinets to make way for mixing tanks and sumps, reinforced tables, the installation of floor drains, new non-corrosive epoxy paint, and new ventilation to keep water vapor out of the rest of the building. Within

the next few weeks, Reef Systems of New Albany will install a 10 tank system for the permanent husbandry of marine organisms. The lab will



also include stand-alone tanks for use in course experiments and for individual student projects. With any luck the system will be up and running with healthy bacteria and be ready for action when the first Aquarium Track cohort is admitted in the spring. Many thanks to Dean Paul Eisenstein and Asst. Provost Jeff Ankrum for championing the project and getting the new Aquarium initiative off to a flowing, bubbling, and salty start.

Dr. Lescinsky (left) is just waiting for the tanks to arrive!



# A Panamazing Experience

During Summer 2018, we had the amazing opportunity to spend five weeks in Panama conducting research on Red-eyed treefrogs at the Smithsonian Tropical Research Institute. We were instantly immersed in a climate and culture that was totally different from Ohio. The air was hot and humid, and rainforest thunderstorms dumped more water out of the sky than we had ever seen before! We lived in a large, open apartment without hot water and reliable phone service. Within the first week, Dr. Bouchard became like a mom to us when she took both of us to the doctor on two separate occasions! Fortunately, it was only for minor sickness likely developed from traveling and lack of sleep.

Every day in Panama was an opportunity to see new rainforest wildlife: countless butterflies, lizards, snakes, monkeys, capybaras, armadillos, agoutis, bats, coatis, and frogs galore! We even had a caiman in our experimental pond!

For our research, we investigated the effects of competition and predation on tadpole development by rearing tadpoles in outdoor tanks at the edge of the rainforest. Data collection consisted of photographing tadpoles, measuring metabolic rates, and dissecting various organs. We became a part of the Smithsonian scientific community by attending weekly Frog Talks, a Women in Science meeting, a seminar on lightning on Barro Colorado Island, and a tour of the Amphibian Research and Conservation Center. We met so many incredible people from all over the world!

We also had the opportunity to experience Panamanian culture. We loved the fresh fruit and getting lunch at the local fonda (food truck). The fish served whole with coconut rice was so good! On days when we had more free time, we watched a cargo ship pass through the Miraflores Locks, played soccer with the locals, and went into Panama City for a night of salsa dancing!

For both of us, the opportunity to visit another country, conduct undergraduate research with one of our favorite animals, and step outside our comfort zone was a life-changing experience. We are beyond thankful for Otterbein University, Dr. Bouchard, and the Biology & Earth Science Department for making this experience possible and for contributing to our growth as students and as people.

*By Emma Kimberly '20 and Gwen Broderick '20*



Red-eyed treefrogs in amplexus



Mesocosms set-up and ready for the experiment



Emma and Gwen enjoying their time in Gamboa

# Stratford Ecological Center Internship

In the summer of 2018, I interned at Stratford Ecological Center as an Environmental Education Intern. Stratford is a non-profit educational organic farm and nature preserve on 236 acres in Delaware County, Ohio. In summer Stratford hosts seven weeks of day camp called "Farm Camp". There are four weeks of 9-12 year olds, three weeks of 6-8 year olds, and one week of 3-5 year olds with their parents. As the Environmental Education Intern, I served as a camp counselor for Farm Camp, which included leading groups around the property. The goal of this camp was to keep kids outside all day immersed in their environment. We also want kids to learn about the value of their food and where it comes from. Stratford is a fully functional farm, so part of my duties included managing everyday responsibilities on the farm. These duties included taking care of both the animals and the land and teaching kids to help with these responsibilities. Stratford taught me to be a flexible worker and has given me the ability to feel confident stepping in to help wherever help is needed. It has also taught me the importance of teaching young people how to cherish their environment in order to foster an understanding of why we must protect it. I will be returning to Stratford in the same role for the summer of 2019.

*By Julie Platz '20*



Department of Biology and Earth Science  
1 S. Grove St.  
Westerville, OH 43081  
Phone: 614-823-1517  
E-mail: drhodgeback@otterbein.edu