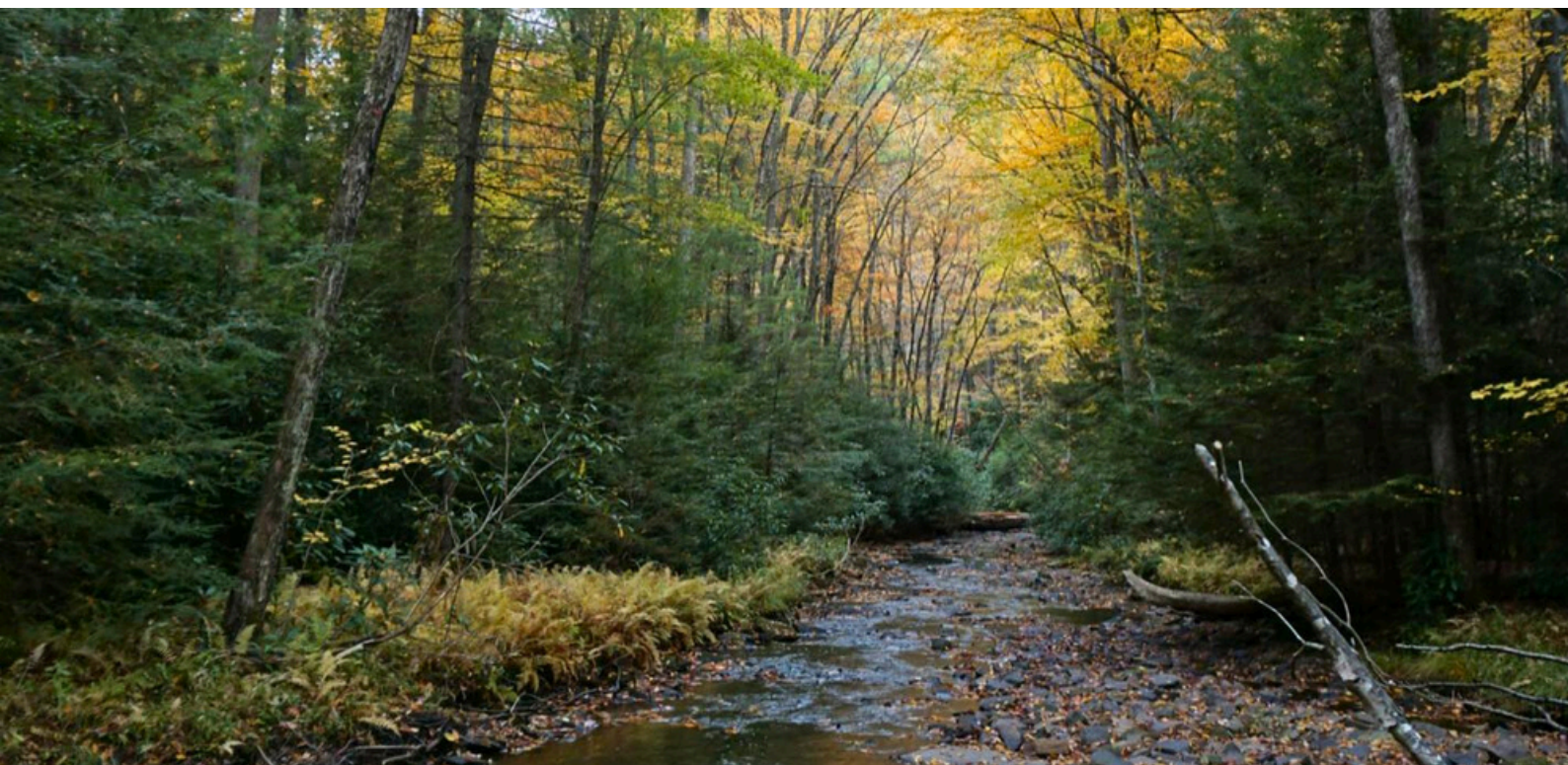


Notes from the Field

The biannual newsletter of the Intercollege Degree Program in Ecology



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Meet Our New Students



The Ecology Program is growing! Join us in welcoming the 2025 cohort to our community

ADRIANA JORDÁN



I am interested in tropical and plant ecology as well as plant-animal interactions. I earned my BS in Environmental Science at the University of Puerto Rico, where I studied the population trends and conservation of a rare, endemic, and endangered mistletoe. Over this past spring, I worked as a field technician in a forest regeneration project near forest fragments in Brazil's Atlantic Forest. These experiences led me to continue working in Brazil for my master's, where I now study seedling survival and performance in early successional tropical plant communities with Dr. Tomas Carlo-Joglar. Outside of research, I enjoy traveling and finding new adventures in the forest and along the coast. (Advisor: **Tomas Carlo-Joglar**)

MACY LITTELL



Macy completed her BA in Biological Sciences at Wellesley College in 2023, where she worked in the Selden Lab studying invasion ecology in the rocky intertidal. Before coming to study larval reef fish in the Majoris Lab at Penn State, she worked as a science educator through zoos, nature centers, and extension programs. Outside of research, Macy enjoys reading, SCUBA diving, cooking, and spending time with her community. (Advisor: **John Majoris**)

KAROLINE FORD



Hello! I recently joined the Lieurance Invasion Ecology lab. My graduate research addresses how climate change alters the chemical composition of invasive Japanese Knotweed, and the resulting impacts on the efficacy of the psyllid *Aphalara itadori* as a biocontrol agent. I'm broadly interested in biocontrol systems and the application of ecological theory to land management and policy decisions. I love hiking, rock climbing, and exploring new places! (Advisor: **Deah Lieurance**)

ELIZABETH HUGHES



Having worked on farms and in forests throughout many of the northeastern states, I am passionate about all things soil and nutrient cycling in both managed and natural ecosystems. My master's research is focused on investigating the anaerobic conditions of the forested, upland soils surrounding an intermittent stream here in Central Pennsylvania. Outside of the lab, you can find me knitting, sewing, hiking, or running! (Advisor: **Jason Kaye**)

RUSSELL WILSON



Generally, I am interested in promoting and protecting native fish and recreational opportunities surrounding them for the public. My research interests cover population dynamics and animal movement, typically relating to fish populations. I completed my master's at the University of Georgia in 2024 studying juvenile sturgeon dynamics and the Ecology program here is my next step in developing the skills I need to make a difference in public waterways. Outside of the lab I enjoy baking, cooking, fermenting, and walking my dog. (Advisor: **Tyler Wagner**)

ZACHARY BUNCH



Zachary Bunch is an ecologist with a background in biology from University of North Carolina at Greensboro, where he completed his MS studying how fire and grazing shape insect communities. He now works on projects that combine field ecology with AI-powered insect monitoring to inform ecological questions. His research focuses on pollinators, biodiversity, and how land management affects insect communities. Zachary is passionate about applied ecology, teaching, and using technology to support ecology-based research. (Advisor: **Christina Grozinger**)

EMILY ROUSH



While earning my B.S. in Environmental Resource Management, I had the opportunity to work with Dr. Jon Sweetman, which inspired me to pursue a master's degree. My research focus is understanding how microplastics move through and interact with wetland soils. My free time consists of working out, reading, video gaming, visiting family/friends or annoying my cat, Royal. (Advisor: **Jon Sweetman**)

JACQUIE MOLLOSEAU



My background and focus is in aquatic ecology. During my undergraduate degree at Grand Valley State University, I conducted research on road salt pollution in urban lakes. After graduating, I got to work with a variety of organisms, including lake sturgeon, Blanding's turtles, freshwater mussels, and fairy shrimp. For my PhD I will be focusing on stream ecology, specifically investigating eDNA sampling methods for aquatic invertebrates and freshwater mussels. In my free time, I love engaging with the outdoors and my creative side through drawing, hiking, biking, and, most recently, pottery. (Advisor: **Daniel Allen**)

HANNAH BRASLAU (SHE/HER)



I'm working on a project looking at how abiotic and biotic factors affect how eDNA is transported in streams. I graduated from Bates College in 2023 and worked as a research tech at Harvard Medical School and Northeastern University's Marine Science Center before coming to Penn State. Outside of lab you can find me climbing, biking or hiking. (Advisor: **Dan Allen**)

ERIN MURRAY



My name is Erin Murray, and I graduated from THE Ohio State University in 2024 with a BS in Zoology with Research Distinction and a minor in Human-Animal Interactions. Between OSU and coming to Penn State, I took a gap year to explore how anthropogenic noise affects marine invertebrates through two research internships in Norway and Germany/France. I'm a current master's student in Ecology in Dr. Jason Keagy's lab looking at how multiple anthropogenic stressors impact hatchling and adult Eastern Bluebirds here in Centre County! When I'm not in the lab, I like to read, knit, hike, and hang out with my cat, Pickle. (Advisor: **Jason Keagy**)

KATHRYN KOO



I am interested in the relationship between biodiversity and disease and am studying an amphibian-killing fungal pathogen in tropical communities. I'm from New York, but I went to UC Santa Barbara for undergrad. In my free time, I enjoy rock climbing, reading, and doing puzzles. (Advisor: **Gui Becker**)

MUQING LIU



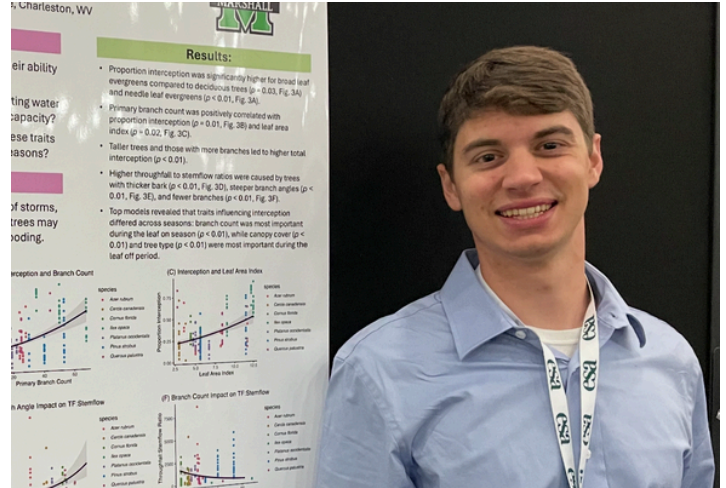
Muqing received her Bachelor's degree in Biological Sciences and her Master's degree in Ecology from Beijing Normal University in China. During her undergraduate studies, she studied the competitiveness of common ragweed and her Master's focused on population genetics and climate adaptation of beech species. Now, as a first-year PhD student in the Ecology program, she is excited to continue working with trees and explore new research directions in Jill's lab. She loves dogs, dry ginger Americanos (a mix of ginger soda and Americano), and having fun - like traveling, studying psychology, or trying interesting things with friends. (Advisor: **Jill Hamilton**)

MAYA GABOR



Maya is a first year PhD student in the Ecology program. She is originally from Rhode Island and moved to State College from Minnesota where she earned a BA in Geology at Carleton College. Her research focuses on how root traits of forage species affect soil health at depths of up to 1 meter. (Advisor: **Suzanne Fleishman**)

NOAH ALVAREZ MANUSZAK



I'm a MS student using tree rings to study how past forest harvesting practices influence forest structure. I'm originally from Tecumseh, MI, a small town near Ann Arbor and Toledo, OH, and I completed my undergraduate degree in Ecology, Evolution, and Biodiversity at the University of Michigan. After taking forest inventory in Michigan for the 2024 field season, I was a technician for a year studying urban tree flood mitigation at Marshall University in Huntington, West Virginia. I worked with people from Marshall and West Virginia State University Extension and got to interact with the public regularly at our several study trees throughout the Huntington-Charleston area. I'm excited to be here at Penn State and hike the area! (Advisor: **Margot Kaye**)

Please join me in offering a warm welcome to our new Ecology Program students.



We look forward to celebrating your successes through your time in the Ecology Program and beyond.

Ecology Student & Faculty Achievements

Join us in congratulating Ecology students and faculty for their recent accomplishments

LIANA BURGHARDT

Plant Science

Dr. Liana Burghardt, assistant professor of Plant Science, was recently awarded Penn State College of Agriculture's **Early Career Research Achievement Award**.

BEE SUITE RESEARCH TEAM

Entomology

The BeeSuite Research team was awarded Penn State College of Agriculture's **Interdisciplinary Research Team Award**. The team includes two Ecology faculty: team lead Christina Grozinger, Publius Vergilius Maro Professor of Entomology and director of Huck Institutes of the Life Sciences and team member Heather Grab, assistant professor of Entomology.

PAULA BLANCO ORTIZ, TALON JOST, & NATALIE FORD

IGDP in Ecology

Three ecology doctoral students were selected by the One Health Microbiome Center at Penn State as 2025-2026 recipients of the **Biotechnological and Integrative Opportunities in Microbiome Science Doctoral Training Fellowship**.

MARGARITA LOPEZ-URIBE

Entomology

Dr. Margarita Lopez-Uribe, Lorenzo L. Langsfirth Early Career Professor and Associate Professor of Entomology, was named a **2025 Institute of Energy and the Environment Fellow**.

SHANNON RYAN

IGDP in Ecology

Shannon Ryan, doctoral student in Ecology advised by Dr. John Tooker in Entomology, recently received the **One Health Microbiome Center's 2025 Interdisciplinary Innovation Fellowship** for her research, "Exploring the role of the mucus microbiome in slug-plant interactions."

SOPHIA MUCCILO

IGDP in Ecology

Ecology doctoral student Sophia Mucciolo, advised by Dr. Sara Hermann (Assistant Professor of Ecology and of Entomology), was awarded a prestigious **NSF Graduate Research Fellowship Program (GRFP)** fellowship for her work on monarch butterflies.

NATALIE FORD, JONAH GRAY, & ELIZABETH MCALPINE-BELLIS

IGDP in Ecology

Ecology doctoral students Natalie Ford, Jonah Gray, and Elizabeth McAlpin-Bellis each received **honorable mention** for the **NSF Graduate Research Fellowship (GRFP)** fellowship.

MOLLY BLETZ

Ecosystem Science and Management

A research team studying amphibians led by Dr. Molly Bletz received a grant from the **Morris Animal Foundation**.

JASON KEAGY

Ecosystem Science and Management

Dr. Jason Keagy, Assistant Research Professor of Wildlife Behavioral Ecology is part of a multi-institution team that **received funding through Scialog: Neurobiology and Changing Ecosystems** for their research, “From Feeding to Flux: Unraveling the Impact of Animal Behavior on Global Ocean Carbon Flow.”

JILL HAMILTON

Ecosystem Science and Management

Dr. Jill Hamilton, Associate Professor of Ecosystem Science and Management, has been named a **Huck Leadership Fellow** for the 2025-2026 academic year.

JANNIRY BELEN

IGDP in Ecology

Janniry Belen, doctoral candidate in Ecology, received the **Katherine Mabis McKenna Award**, which recognizes an outstanding graduate student with research related to the use of plants for environmental stewardship.

VERONICA ROMÁN-REYNA

Plant Pathology

Dr. Veronica Román-Reyna, Assistant Professor of Plant Pathology and Dr. Purnima Neogi, Assistant Teaching Professor of Biology at Penn State Harrisburg were named **Harbaugh Scholars** to support their project “Into the Microverse: In-House Whole Genome Sequencing to Enhance Student’s Learning in Microbial Genomics.”

EMMA RICE

IGDP in Ecology

Emma Rice, doctoral candidate in Ecology, was awarded the College of Agricultural Science’s **William J. and Anne E. Scarlett Award in Watershed Management**, which recognizes students for academic excellence in research focused on water conservation and stewardship.

CHRISTINA GROZINGER

Entomology

Dr. Christina Grozinger, Publius Vergilius Maro Professor of Entomology and director of the Huck Institutes of the Life Sciences was recently appointed by **The National Academy of Sciences, Engineering, and Medicine** to an 18-member committee on insect declines in North America.

SARAH RICHARDS

IGDP in Ecology

Sarah Richards, a doctoral student in Ecology and dual-title in INTAD, received a **2025 Penn State Alumni Association Dissertation Award**.

ISABELLA PETITTA

IGDP in Ecology

Isabella Petitta, a master’s student in Ecology, received a **2025 Distinguished Master’s Thesis Award** from the Fox Graduate School at Penn State.

EDWARD AMOAH

IGDP in Ecology

In April, recent Ecology graduate Edward Amoah earned 2nd place in the Modeling category of the Graduate Division at the Penn State chapter of **Gamma Sigma Delta’s Annual Research Expo**.

EMMA VAN DER HEIDE

IGDP in Ecology

Ecology Ph.D. Candidate Emma van der Heide won the **Ecological Society of America’s 2025 Simberloff Award for Outstanding Presentation** for her presentation, “Death by two cuts: early life stress enhances management success for an invasive thistle.”

ZACHARY BUNCH & LAURA SCHUCK

IGDP in Ecology

Two Ecology students, Zachary Bunch and Laura Schuck, received **Simons Graduate Fellowships in Ecology and Evolution**.

Andersen Award Reflections: Reflections from two 2025 Andersen Award Recipients

Janniry Cabrera Belen (she/her/ella), Ph.D. Candidate in IGDP Ecology
The Society of Freshwater Science's (SFS) conference



Janniry Cabrera Belen presenting her work at the SFS Conference. (source: Janniry Cabrera Belen)

In the spring of 2025, I had the honor of being awarded the Frank A. Andersen Travel Award, which allowed me to attend my first professional conference as a PhD candidate. At the end of May, I traveled to “La Isla Del Encanto” Puerto Rico to give a talk at The Society of Freshwater Science’s (SFS) conference. At this meeting, I presented to freshwater scientists about my work on the ecological dynamics of riparian communities in relation to streambank erosion.

To say I was excited to give a talk to an enthusiastic scientific audience was an understatement. Giving said talk at such a

beautiful location added to the thrill. The Society of Freshwater Science annual meeting is typically held within the continental U.S., but this year they decided to host it in PR, a U.S. territory, because of its unique and convenient location for those outside of the U.S. This allowed researchers from all over the world to join. This was particularly useful to me since the majority of erosion work is done in Europe and Asia. I met a researcher from Japan who was working on improving the physical form and function of rivers and who works at one of the largest experimental laboratories for erosion worldwide.

On top of the amazing variety of researchers present at this conference, there were also endless opportunities to network and socialize. The poster sessions were entertaining and informative. I talked to restoration ecologists about my work and findings, while also shamelessly plugging my talk time and session. Coffee breaks fostered a chill environment where you could compliment peers on their presentations, and finally work up the nerve to talk to senior researchers. And afternoon mixers with live music curated the ideal vibe to scope out post-doctoral opportunities.

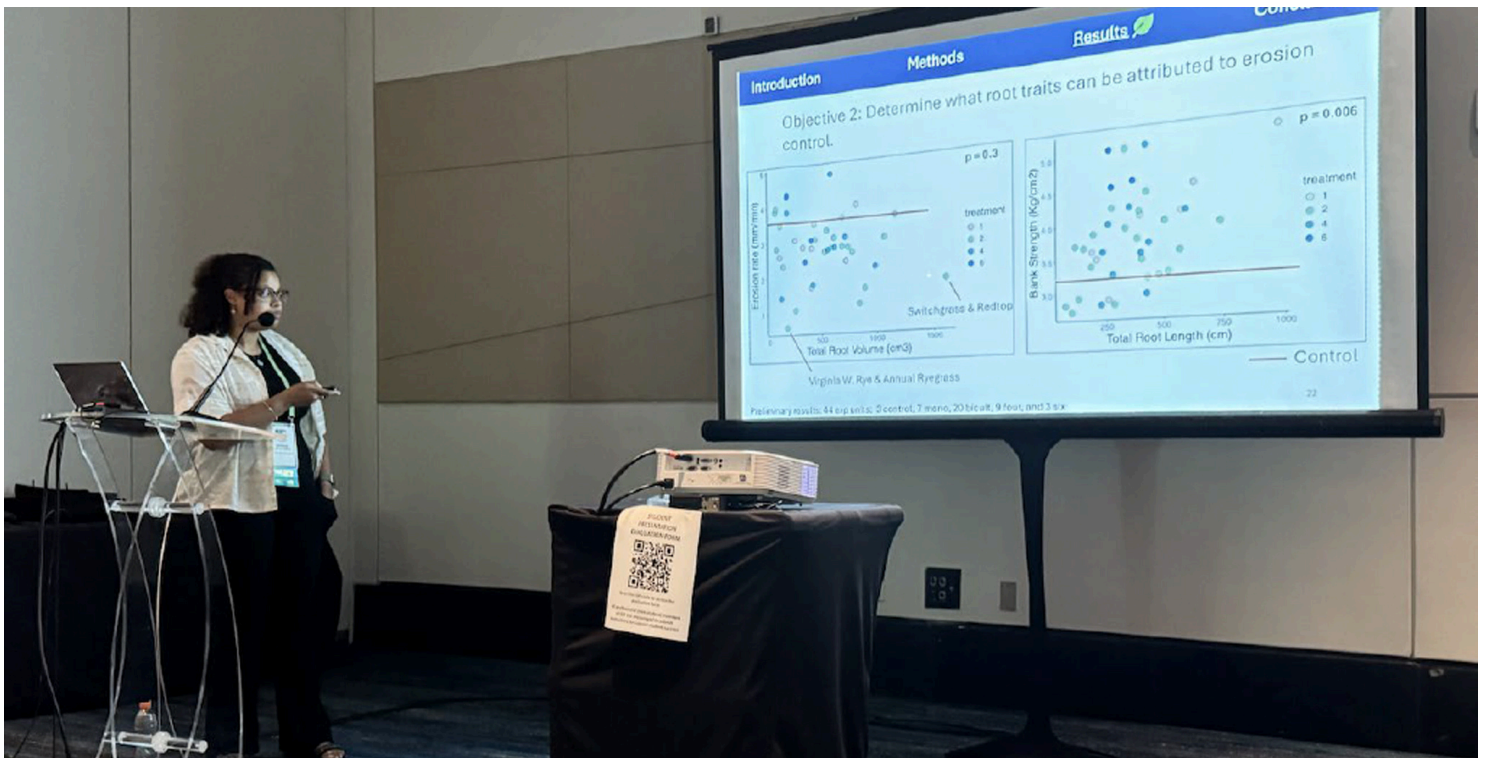
My talk was on the last day of the conference, and I was worried no one would show. I figured everyone would skip the last day to sunbathe on the beautiful Puerto Rican beaches. To my surprise, the room was packed, with some individuals even standing in the back. After my talk, I got some good questions and even

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On top of the amazing variety of researchers present at this conference, there were also endless opportunities to network and socialize.

connected with someone from the USDA about my work. I could not have hoped for a more welcoming reception to my research and myself.

To say that I am grateful for this opportunity is an understatement. I am privileged to travel to a conference and not have to worry about the expenses due to being awarded the Frank A. Andersen travel award. So, to the Ecology program, to Frank A. Andersen, to Huck, thank you for the opportunity you have granted me and for an experience that I will always cherish.



Janniry Cabrera Belen presenting her work at the SFS Conference. (source: Janniry Cabrera Belen)

Emma van der Heide, Ph.D. Candidate in IGDP Ecology Ecology and Management of Alien Plant Invasions (EMAP) Conference

I was lucky enough to receive the Frank A. Andersen Travel Award this year to support my attendance at the 17th Ecology and Management of Alien Plant Invasions (EMAPI) Conference, held in September 2025 in Christchurch, New Zealand. This international conference has been held on every inhabited continent except Asia since its inception in 1992. This year, attendees hailed from 25 different countries, with representatives from academia, government, and the private sector.

At the conference, I presented my work on the management of the invasive thistles *Carduus nutans* (musk thistle) and *C. acanthoides* (plumeless thistle), with a focus on avoiding wasted management effort against these highly resilient species. I demonstrated that our interpretation of the “success” of management depends on the plant traits measured to quantify management’s effect. Presenting alongside many of the world’s foremost experts in invasive plant ecology was a surreal experience, and



Conference attendees outside Ivey Hall, Lincoln University, New Zealand. (source: Emma van der Heide)

an incredibly valuable opportunity to network with and solicit advice from scientists I’ve long respected.

One of the highlights of this conference was the field trip I joined to Lake Ellesmere/Te Waihora. This coastal lagoon and its surroundings are the subject of various management and restoration efforts. We visited two such sites. One is a wetland that has been restored after the cessation

of grazing, but which requires yearly management to remove invasive willows. The other is a section of Kaitorete Spit, which separates Te Waihora from the Pacific Ocean and represents a rocky beach and dune habitat home to several endemic plants, a flightless moth species, geckos, and skinks. By managing a buffer zone that separates a heavily invaded section of beach from a mostly intact section, the New Zealand Department of Conservation holds the line against invasive plants.



New Zealand is perhaps one of the best places in the world to hold a conference about invasive plants

New Zealand is perhaps one of the best places in the world to hold a conference about invasive plants, as both the north and south islands of New Zealand are home to many more invasive species than expected for islands of their size. Likely because of this fact, I noticed that the average New Zealander seemed well-educated on the topic of invasive species, and many hospitality workers were happy to talk with me about the species of greatest concern in their area. Several sessions of the conference were devoted to wilding pine invasion in New Zealand. You can see this problem for yourself in the background of many scenes in Lord of the Rings; though often adding to the drama of the scenery, none of the pines on your screen are native to the filming location!

As an American, it was also really interesting to see how our native species, like Lodgepole pine (*Pinus contorta*) and Douglas fir (*Pseudotsuga menziesii*), constitute much of the wilding pine problem in New Zealand. This invasion is also interesting because of the competing interests of different groups within New Zealand. Even as conservation professionals try to remove or control wilding pines, they are still planted in many areas of the country for their use as forest products. Indeed, the conflicting objectives of various stakeholders were common themes in many of the presentations on other topics, as well.

Overall, attending EMAPI was an incredibly valuable experience that allowed me to build my professional network, practice my scientific communication skills, and learn about the biggest invasion ecology challenges facing New Zealand and the broader world. I would like to express my deepest gratitude to F. Alan Andersen for establishing the award, and to the Andersen Award committee for selecting my application and making it possible for me to attend the conference.



The **Frank A. Andersen Travel Award** was established by F. Alan Andersen in memory of his father, Frank A. Andersen. This endowed award assists Ecology graduate students in attending national or international professional conferences. Award recipients must give an oral presentation at the conference, and later write a reflection on their experience at the conference. The call for applications goes out towards the beginning of each spring semester.

As travel costs have increased, we are seeking to grow this award. If you would like to donate to this award you can do so [here](#).

Alumni Insights

Fall 2025 Newsletter Editor **Ryan Trexler** asks Ecology alumni to share their advice and perspective on how to find success and satisfaction in our work

As ecologists we recognize disturbance, adaptation, and community as important concepts in ecology and understand how they contribute to shaping populations. In some ways these ideas reflect the realities of our recent experiences as scientists. In 2020 we faced the Covid-19 pandemic and the disturbance it caused in our personal lives, academic endeavors, and research projects. Looking back five years later, clearly, we were adaptable in how we lived, how we learned, and the scholarship we produced. It has also been apparent how community and community support systems have been extremely valuable during and after this time. In similar ways, recent cuts to federal funding have represented a major disturbance to our scientific work and career trajectories by changing the landscape of what and how science is funded in the US. In this respect, I have asked some of our Ecology alumni for their advice and perspective on how to find success and satisfaction in our work despite major hurdles that may arise. Taken together, their responses highlight common themes of advice: remain resilient while withstanding disruption by adapting and building community.

As a result of the interdisciplinary nature of the IGDP in Ecology, a key benefit of the program is that it prepares students to think and learn with intellectual breadth. Though we prepare our Master's or Doctoral theses by answering very specific questions and of course becoming experts in specific fields, we also learn and work alongside a diverse set of people who have different experiences and often study very different topics. This is a unique advantage in an environment of

changing granting priorities and job markets. Here, an interdisciplinary foundation provides the ability to talk across subfields, understand or teach a wide range of topics, and pivot between research areas or even career paths if necessary.

Further, it is clear from our alumni that a supportive community of mentors, collaborators, and peers is critically important in finding success and enjoyment in our work. Our alumni cited the encouraging environment during their time in the Ecology program as influential in shaping their current careers and identified that some of the most rewarding parts of their jobs now are helping to support the success of others. In this way, the collaborative and supportive culture of the Ecology program continues to ripple outward as graduates carry that ethos of mentorship and helpfulness into the broader ecological community.

The following Ecology alumni graciously responded to my request and offered their advice (compiled below):

- **Dr. Luke McCormack**, Research Scientist at the Center for Tree Science, The Morton Arboretum (Ph.D. in Ecology and Biogeochemistry, 2012)
- **Dr. Kevin Mueller**, Associate Professor of Biological, Geological and Environmental Sciences at Cleveland State University (Ph.D. in Ecology and Biogeochemistry, 2011)
- **Dr. Lindsey Swierk**, Assistant Professor of Biological Sciences at Binghamton University (SUNY), (Ph.D. in Ecology, 2014)
- **Dr. Jenny Tennessen**, Senior Research Scientist in the Center for Ecosystem Sentinels at the University of Washington (Ph.D. in Ecology, 2015)

- **Dr. Jennifer M. Withington**, Associate Professor of Biology at The State University of New York at Oneonta (Ph.D. in Ecology, 2005)
- **Dr. Caylon Yates**, Microbiome Scientist at Funga (Ph.D. in Ecology, 2023)



What advice do you have to offer current MS and PhD students in Ecology to navigate the job market given the current landscape of science funding in the US?

“One of the most useful (and really interesting!) genres of workshops I attended during graduate school at Penn State was about science communication. Over a series of different trainings I learned how to incorporate concepts from human psychology and design to craft interesting, visually engaging presentations, and how to develop narrative to concisely tell a story about my research instead of just present the results. I encourage students to seek out as much science communication training as possible! I don't think you can learn too much about this important (and often forgotten) step of the scientific process, especially as traditional funding sources dry up and we need to think more creatively about finding funders and identifying our audience.” -**Dr. Tennessen**

“Be persistent. Ask yourself if you truly wish for a job that relies heavily on external funding or if you would be happy in a different type of position. Research positions are not the only possibility, if you could see yourself working in a job more tied to education and less to research.” - **Dr. Withington**

“I would advise current students to not just seek out future employment where there is a history of funding but to seek out collaborators who are just as eager to help their students/postdocs find funding as well.” - **Dr. Yates**

“Everyone's advice is anecdotal and outdated, so be careful who you listen to and why you listen to them (especially if they don't start and finish with a disclaimer). When I look at 'successful academics', they often have some combination of: 1) openly lofty ambitions, 2) strong allies and collaborators, 3) resilience to rejection, and 4) a positive feedback loop built deliberately and steadily, often on top of early-ish success (and early-ish aspirations). Most of the 'successful' researchers that I know don't seem to be more intelligent or to work harder than their less successful peers, but they do seem more focused on thoughtfully generating and maintaining that positive feedback loop, and more willing or able to embrace and tolerate a work-life balance that is occasionally (but selectively) out of tune.” - **Dr. Mueller**

“Be open-minded about what opportunities you pursue and investigate anything that seems remotely interesting - even if it doesn't seem like a perfect fit at first. I believe those who are best able to navigate the current landscape are often the ones willing to take advantage of unexpected or unplanned opportunities.” - **Dr. Swierk**

“Standard modes of research, teaching, and learning are changing rapidly. Think about the specific ways your work and skills will be relevant despite or because of these changes and highlight that in your communications. The answers here should be well thought out, but do not need to be complex.” - **Dr. McCormack**



How did your time in the Ecology program prepare you for your current career?

“Taking a wide range of classes across multiple disciplines helped me to be ready to teach a wide variety of undergraduate courses.” - **Dr. Withington**

“One of the really terrific aspects of the flexibility of the Ecology Program is that I learned how to fund my own research, with the generous mentoring of my co-advisors Dr. Tracy Langkilde and Dr. Susan Parks (now at Syracuse University). Identifying grants and crafting compelling proposals is a vitally important skill to build, whether you plan to stay in academia, build your own start-up, work in non-profits, do consulting jobs, go into education, work in applied conservation, or many other avenues. Moreover, the Ecology Program at Penn State provided an interdisciplinary community of scholars with whom to share ideas that transcended traditional disciplinary boundaries. I enjoyed opportunities to learn about new and interesting areas of research that wouldn't have been on my radar otherwise. This perspective-broadening prepared me to be conversant across a much wider range of ecological topics than a traditional departmental program could have offered.” -**Dr. Tennesen**

“Diverse training with exposure to different disciplines and people helped make me and my work more adaptable to different questions and contexts.” - **Dr. McCormack**

“I learned how to perform and promote 'good science', by listening carefully for the constructively critical and insightful questions and comments of my peers and professors, by seeing science through their diversely but firmly grounded eyes. It takes effort, practice, and a weird blend of arrogance and humility to see something well enough, and wholly enough, to identify the weaknesses and opportunities for improvement in science. Perhaps most valuable to me, was the space that I was given by my advisors to be curious, creative, collaborative, and aspirational as I was identifying knowledge gaps of interest to me and potential approaches to fill those gaps.” - **Dr. Mueller**



What's the most rewarding part of your current work?

“The most rewarding part of my current work is the opportunity not only to continue studying soil communities but also to apply that research on a large scale in southeastern forests.” - **Dr. Yates**

“One of my favorite things about my current position is connecting with other researchers, from students to established faculty, and the creativity that follows!” - **Dr. Swierk**

“Creating new knowledge with other inspired scientists, young and old. Curating old knowledge to share with hungry minds. Seeing when, through one machination or another, I have helped to light or feed a fire in someone else. Rare but rewarding wins when pushing against the stale, misguided, authoritarian, and overly narrow parts of science culture.” - **Dr. Mueller**

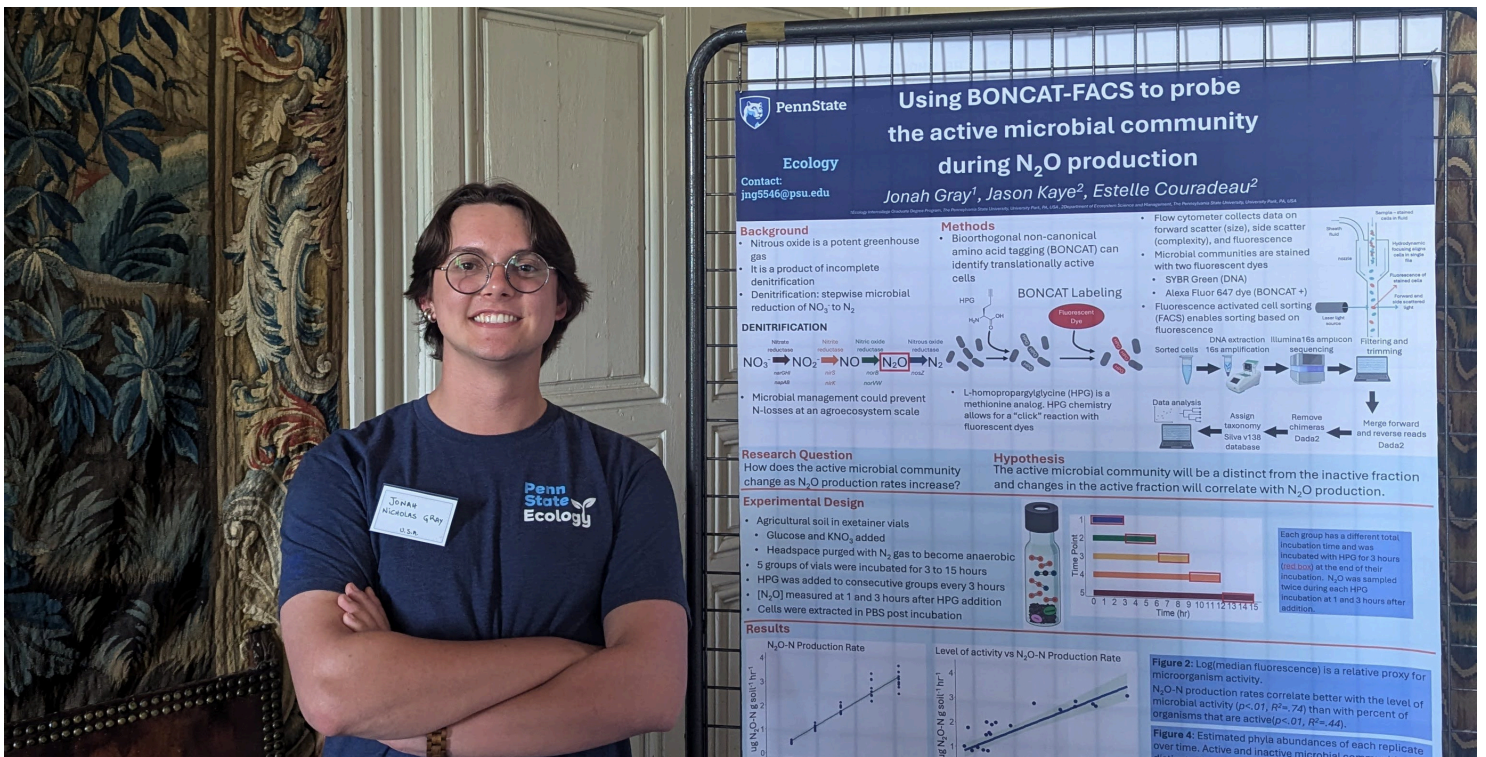
“Watching others around me grow in their own skills, independence, and creativity.” - **Dr. McCormack**

“When a student who has been struggling with a concept finally gets it. The smile is worth everything.” - **Dr. Withington**

“I have the agency to be creative, to dream up research projects and seek the funding to carry them out. This comes with a fair bit of stress of course, like when funding runs low, but being able to direct my own research program is worth it. Also, I love the data sets that I get to work with - literally, data recorded from the backs of whales! I continue to find joy and awe in these data and that spark keeps me going through the storms.” - **Dr. Tennesen**

Microbial Ecology in Agroecosystems: The microbiome's role in N₂O emissions

Research Spotlight: **Jonah Gray**, Ph.D. Student in Ecology & Microbiome Sciences



Jonah Gray presents at the Microsoil conference in France. (source: Jonah Gray)

I am a third year Ph.D. student in Ecology and Microbiome Sciences, and I am co-advised by Estelle Couradeau and Jason Kaye. My work ranges from the microscale to the landscape scale, but it all centers around nitrous oxide (N₂O) emissions from agroecosystems and the process of denitrification. During my time at Penn State, I have had the opportunity to explore the role of soil microbiomes in N₂O emissions utilizing the BONCAT-FACS method and share that work with an international audience.

Nitrous oxide is a potent greenhouse gas with

~300x the global warming potential of carbon dioxide. It is a product of denitrification, the process by which microorganisms convert nitrate to di-nitrogen gas (N₂). Unfortunately, conditions in the soil may not always favor complete denitrification, and instead of N₂, N₂O is emitted. Despite decades of research on N₂O emissions, we are still unable to accurately predict when and where they will occur.

There are certainly agricultural management practices that can reduce emissions, but many practices live in a gray area. Sometimes they reduce emissions and sometimes they don't. Many studies

fail to consider the microorganisms that are contributing to this flux and choose to leave it as a black box. It's true that many organisms have denitrifying potential, but the potential to be active does not mean they are actively contributing to the N_2O flux.

Using the BONCAT-FACS method, I was able to identify an ensemble of organisms that are active during N_2O production in soil and track how that group changed while flux rates increased—to our knowledge, this is the first application of this method to track soil denitrifiers. In short, our results indicate that N_2O fluxes are driven not by changes in a single taxon but by shifting ensembles of active microorganisms in which the combined functional potential supports consistent emissions.



To our knowledge, this is the first application of this method to track soil denitrifiers.

Through connections made at Penn State, I was invited to attend and present at the Microsoil conference in France hosted by the Sain Loup Research Institute. I was able to attend this unique and incredible opportunity thanks to the generous travel grants offered by the Huck Institute of Life Sciences and the ESM department. The Microsoil conference took place at Chateau de Saint-Loup-sur-Thouet, a chateau with history dating back to the 1600s. This intimate location fostered rich conversations between researchers from across the globe. Here, I presented a poster and met other researchers and students from across the globe. I have continued to work with them after the conference to write a summary of the presentations and discussions that occurred—we hope for it to be published soon.

Overall, none of this would've been possible without the immense support of the Ecology program, my advisors and colleagues. I look forward to continuing this work to test a variety of management practices and measure the impact on the active microbial community and N_2O emissions.



Chateau de Saint-Loup-sur-Thouet, where the Microsoil conference took place. (source: Jonah Gray)

Postdoc Spotlight:

A New Postdoc-Led Course for Ecology Students

Dr. Sheryl Hosler, Post-doctoral Scholar in Ecology



Broadly, I call myself a community ecologist, because beyond examining dynamics of ecological communities, my research endeavors have been very different from one another. I did my master's in northwestern Illinois in a restored tallgrass prairie site managed by The Nature Conservancy, where I was tasked with conducting a survey of dung beetles living in the restored and remnant sites. I used pitfall traps to collect beetles and discern whether their patterns of abundance, species diversity, and activity were affected by the presence of the bison, the implementation of prescribed fire rotations, and the amount of time since a site had been restored from agricultural land to prairie. My PhD research focused on the responses of bees and flowering plants to land management in the Chicago suburbs. I recruited almost 100 private homeowners to my study and compared the bees and plants living in their backyards to those living in powerline corridors across four counties.

I joined PSU as a postdoc in May of 2024 and immediately dove into the huge data set collected at Dr. Kaye's Cover Crop Cocktails study. I have been organizing and analyzing data on how the different cover crop species responded to environmental variation and interacted with one another in multi-species mixtures. Cover cropping is a sustainable agriculture strategy intended to promote soil health and provide a variety of ecosystem services to farmers. The research work I'm doing here can be used to help farmers make more informed decisions about their cover cropping strategies. While the project design initially felt really intimidating, I have been so lucky to find myself in two fun and supportive lab groups. I've really enjoyed getting to know everyone, participate in field work, and gain mentorship experience.

I am excited to be offering a Special Topics course for Ecology during the Spring 2026 semester! Most of the statistical analyses I use in my day-to-day work are not techniques I learned in my basic biostatistics courses. Instead, the most important methods in my toolbox are things I worked on with advisors or taught myself. Things like ordination and multivariate analyses are core skills for community ecologists, so it is important for us to learn them early on and be comfortable

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using them. My ECLGY 597 course will provide Ecology graduate students with the opportunity to learn these core analytical methods in a group setting. I am grateful to the brave students who have registered for the course, as this will also be an important training opportunity for me on my path to becoming a professor.

Dr.s Kaye and Lowry suggested I offer ECLGY 597 as a way to strengthen the Teaching Statement portion of my job application materials. While I have years of experience as an informal educator and have held multiple TA positions, I have yet to design my own course from scratch. I'm excited to put my teaching philosophy of discussion-based learning and application-based assessment to work

in this course, and I'll be encouraging students to use their own data so their coursework is immediately useful to their degree rather than feeling like "extra work." Everyone in the Ecology program has been so helpful as I worked to set up the course, especially allowing me to use a Special Topics designation to test out the new class concept, permitting a postdoc to offer a new course, and designating my course as one that can count toward your degree stats requirement. And while right now I only expect to be at PSU and able to offer this course during the Spring of 2026, there has already been discussion about myself or another Ecology faculty member continuing to offer the class in the spring. I am so grateful for all of the inquiry emails and the full class roster; I'm glad what I'll be offering is something you all find useful!

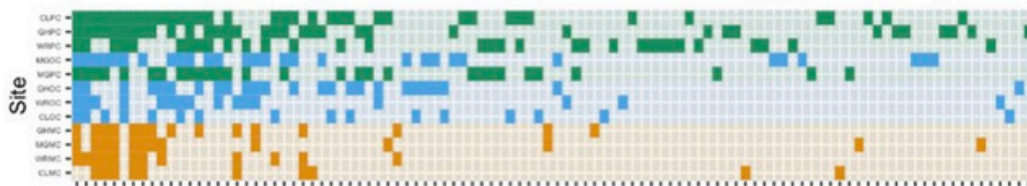
BIOSTATISTICS FOR COMMUNITY ECOLOGY

ECLGY 597

Monday/Wednesday 10:10AM - 11:00AM

Huck Life Sciences Building 008

Instructor: Dr. Sheryl Hosler, sxh5090@psu.edu



This course will cover (1) biodiversity metrics, (2) cluster analyses, (3) functional and phylogenetic diversity, (4) distance matrices, (5) ordination, (6) multivariate analyses, and (7) path analyses.

Students will be encouraged to use their own data to ensure course material is applicable to their research needs.

Prerequisites: Basic familiarity with R software and R Studio; previously passed either ENT 535 or WFS/FOR/SOILS 597

Graduate Student Publications

Akindele, E. O., Adedapo, A. M., Akinpelu, O. T., Kowobari, E. D., Folorunso, O. C., **Fagbohun, I. R.**, et al. (2025). A spatial inventory of freshwater macroinvertebrate occurrences in the Guineo-Congolian biodiversity hotspot. *Sci Data*. 12, 227. doi: [10.1038/s41597-025-04471-5](https://doi.org/10.1038/s41597-025-04471-5)

Bresciani, L., Custer, G. F., Koslicki, D., and Dini-Andreote, F. (2025). Interplay of ecological processes modulates microbial community reassembly following coalescence. *The ISME Journal*. 19, wraf041. doi: [10.1093/ismejo/wraf041](https://doi.org/10.1093/ismejo/wraf041)

Bunch, Z. L. T., Avolio, M. L., Koerner, S. E., Wilcox, K. R., Zeglin, L. H., and Komatsu, K. J. (2025). Patch-Burn Grazing is Similar to Annual Burning in Effects on Belowground Invertebrates in Tallgrass Prairie. *Rangeland Ecology & Management*. 101, 140–146. doi: [10.1016/j.rama.2025.04.003](https://doi.org/10.1016/j.rama.2025.04.003)

Buttimer, S., Medina, D., Martins, R., da Silva, A., Neely, W., Haddad, C., et al. (2025). Experimental Drought Suppresses Amphibian Pathogen Yet Intensifies Transmission and Disrupts Protective Skin Microbiome. *GLOBAL CHANGE BIOLOGY* 31. doi: [10.1111/gcb.70275](https://doi.org/10.1111/gcb.70275)

Egan, M., **Weber, A.**, Gorman, N., Eichholz, M., Skinner, D., Schlichting, P., et al. (2025). When, where, and how prey pair antipredator behaviors to natural and anthropogenic mortality risks. *Movement Ecology*. doi: [10.22541/au.173640749.96014838/v1](https://doi.org/10.22541/au.173640749.96014838/v1)

Emmen, I. E., **Vuyk, W. C.**, Lail, A. J., Wolf, S., O'Connor, E. J., Dalvie, R., et al. (2025). SARS-CoV-2 Genomic Surveillance from Community-Distributed Rapid Antigen Tests, Wisconsin, USA. *Emerg. Infect. Dis.* 31. doi: [10.3201/eid3113.241192](https://doi.org/10.3201/eid3113.241192)

Friant, S., Mistrick, J., Luis, A., **Harden, C.**, Simons, D., Fichet-Calvet, E., et al. (2025). Reducing the threats of rodent-borne zoonoses requires an understanding and leveraging of three key pillars: disease ecology, synanthropy, and rodentation. *LANCET PLANETARY HEALTH*. 9. doi: [10.1016/j.lanplh.2025.101300](https://doi.org/10.1016/j.lanplh.2025.101300)

Frost, M. D. T., Trimas, G. E., Johnston, K. A., **Bunch, Z. L. T.**, Jolin, A. D., and Koerner, S. E. (2025). Native plant species exhibit consistent drought advantage over introduced species until additional global change drivers are included: A grassland meta-analysis. *Journal of Ecology*. 113, 2698–2711. doi: [10.1111/1365-2745.70123](https://doi.org/10.1111/1365-2745.70123)

Gabor, M. G., **Hofmann, M. K.**, and Hernández, D. L. (2025). Poultry grazing accelerates the ecological benefits of perennialization in a regenerative agroforestry system. *Agroecology and Sustainable Food Systems*. 1–21. doi: [10.1080/21683565.2025.2561835](https://doi.org/10.1080/21683565.2025.2561835)

Gilbert, N. A., Bell, R. C., Catenazzi, A., Martins, R. A., **Buttimer, S.**, Neely, W. J., et al. (2025). Reproductive habitat mismatch influences chytrid infection dynamics in a tropical amphibian community. *Global Ecology and Conservation* 60, e03599. doi: [10.1016/j.gecco.2025.e03599](https://doi.org/10.1016/j.gecco.2025.e03599)

Harris, J., Bledsoe, R., Guha, S., Omari, H., Crandall, S., Burghardt, L., et al. (2025). The activity of soil microbial taxa in the rhizosphere predicts the success of root colonization. *MSYSTEMS*. 10. doi: [10.1128/msystems.00458-25](https://doi.org/10.1128/msystems.00458-25)

Jost, T., Henderson, A., LaBumbard, B., Magori, K., Stokes, A., Bergin, D., et al. (2025).

Tetrodotoxin, fungal pathogen infection, and bacterial microbiome associations are variable in the skin microecosystems of two *Taricha* newt species. *Front. Amphib. Reptile Sci.* 2, 1503056. doi: [10.3389/famrs.2024.1503056](https://doi.org/10.3389/famrs.2024.1503056)

Kural-Rendon, C., **Ford, N.**, Hooser, K., and Wagner, M. (2025). Intraspecific plant-soil feedbacks alter root traits in a perennial grass. *RHIZOSPHERE*. 35. doi: [10.1016/j.rhisph.2025.101120](https://doi.org/10.1016/j.rhisph.2025.101120)

Lail, A. J., **Vuyk, W. C.**, Machkovech, H., Minor, N. R., Hassan, N. R., Dalvie, R., et al. (2025). Amplicon sequencing of pasteurized retail dairy enables genomic surveillance of H5N1 avian influenza virus in United States cattle. *PLoS One*. 20, e0325203. doi: [10.1371/journal.pone.0325203](https://doi.org/10.1371/journal.pone.0325203)

Marquez, M. R., Talukder, H., Cheng, W., Becker, D. J., Wimberly, M. C., and Yang, A. (2025). Micro- and Macroenvironment and Habitat Influences on Tick Abundance in Oklahoma City Urban Parks. *The American Journal of Tropical Medicine and Hygiene* 113, 187–199. doi: [10.4269/ajtmh.24-0418](https://doi.org/10.4269/ajtmh.24-0418)

Moser, C. F., Ceron, K., **Schuck, L. K.**, Santana, D. J., Solé, M., Iop, S., et al. (2025). Current state of the art in anuran dietary studies in Brazil. *Discov. Ecol.* 1, 9. doi: [10.1007/s44396-025-00008-7](https://doi.org/10.1007/s44396-025-00008-7)

Richards, S. C., King, W. L., Cao, L. Y., Bradley, B. A., **Rice, E. K.**, Lowry, C. J., et al. (2025). Microbial Colonizers in an Agroecosystem Under Diverse Cover Crop Treatments. *Phytobiomes Journal*. doi: [10.1094/PBIOMES-07-25-0054-R](https://doi.org/10.1094/PBIOMES-07-25-0054-R)

Stachler, E., et al. [+29 coauthors, including **Vuyk, W. C.**] (2025). Establishing Methods to Monitor Influenza (A)H5N1 Virus in Dairy Cattle Milk, Massachusetts, USA. *Emerg. Infect. Dis.* 31. doi: [10.3201/eid3113.250087](https://doi.org/10.3201/eid3113.250087)

Tuschhoff, B., and Kennedy, D. (2025). Heterogeneity in and correlation between host transmissibility and susceptibility can greatly impact epidemic dynamics. *JOURNAL OF THEORETICAL BIOLOGY*. 611. doi: [10.1016/j.jtbi.2025.112186](https://doi.org/10.1016/j.jtbi.2025.112186)

Wu, N. C., Anderson, R. O., Borzée, A., **Buttimer, S.**, Dezetter, M., Dubiner, S., et al. (2025). A user's guide for understanding reptile and amphibian hydroregulation and climate change impacts. *Conservation Physiology*. 13, coaf038. doi: [10.1093/conphys/coaf038](https://doi.org/10.1093/conphys/coaf038)

NETWORKING FOR ECOLOGISTS

The Ecology Graduate Student Organization is seeking connections with **ecology program alumni** to foster networking opportunities for current students.

If you'd be interested in sharing your experience, please fill out the form below!

<https://tinyurl.com/bdh5szjz>

