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PENN STATE ECOLOGY

Notes from the Field

The biannual newsletter of the Intercollege Graduate Degree Program in Ecology

The Pennsylvania State University

Table of Contents

Water lilies at Black Moshannon State Park. Photo Credit: Staci Amburgey

Introduction to the Spring Seminar Series

Monique Pipkin and Madalyn Meyers

This year's theme is "Behave like an Ecologist: Research Exploring Behavioral Ecology." The seminar series will focus on organismal behavior, what influences and changes animal choices and how these choices impact their surrounding environment. The framework of behavioral ecology addresses fundamental questions at the individual, population and community levels. Questions about how organism choices are reinforced, the pressures that drive the evolution of behavioral dynamics, and how changes to these dynamics shape organism interactions link the fields of ecosystem sciences, biology, ecology and neuroscience alike. Furthermore, an appreciation for this integrative field allows for insightful predictions as to how ecosystem dynamics will respond to the changes of today's world. As such, this seminar series has the ability to spark interest in individuals, widely, across the University, and foster interdisciplinary collaboration. We hope this series will provide a broad framework from which to better understand behavioral ecology in the context of classical ecological theory, evolution, and physiology.

This spring, we will be joined by a diverse set of scholars. Included in this list is Dr. Barbara Helm from the University of Glasgow who studies the impacts of environmental dynamics on avian parental care. Jeremy McNeil from Western University focuses his lab on understanding the reproductive strategies of insects that migrate in response to habitat change. Dr. Jill Pruetz from Texas State University studies dynamics of tool use and landscape navigation in primates, and Annie Leonard from the University of Nevada address a number of dynamics in insect behavior including mate choice, learning and decision making. Stay tuned for a complete list of visiting speakers who will be sharing their experiences and results while working in the field of behavioral ecology.

Fall Picnic and Apple Cider Pressing

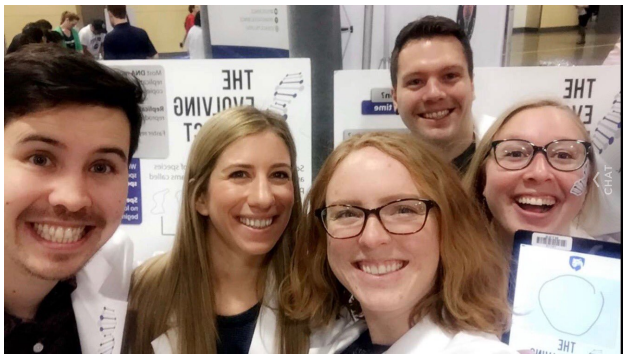
Staci Amburgey

The Ecology picnic and cider pressing at Sunset Park Pavilion. Photo Credit: Kirsty MacLeod

This fall the Ecology program wanted to try a different spin on the traditional beginning of the year picnic. Like previous fall semesters, Ecology program faculty, staff, and graduate students from across the University joined together in Sunset Park to celebrate the start of the semester and welcome new program members. With the main entrée grilled and provided by the Ecology program, attendees brought potluck-style sides and desserts to add to the spread. Faculty introduced their new graduate students while other important program announcements were made. However, this year the picnic was delayed until October so that students could take advantage of the harvest and bring their own freshly picked apples to press them into cider.

Program chair, Jason Kaye, was inspired by program alumnus Luke McCormack and provided the apple cider press while students and faculty assisted with grinding, pressing, and juicing of apples into delicious fresh cider. Picnic attendees passed around pitchers of apple cider for everyone to try, and several attendees commented on how they had never tasted freshly pressed cider.

Students either voluntarily picked apples as part of an exchange for research assistance on a local apple growing research program or brought picked apples purchased from the nearby Way Fruit Farm orchard. With food, cider, and Ecology mingling, the fall picnic was an enjoyable way to come together after the summer break.



Chad Nihranz and Andie Chan (photo credit) participated in the USA Science and Engineering Festival where they used an iPad application to teach children about mutations and evolution.

Welcome 2019 EGSO Officers!

Thank you to all the officers of the 2018 Ecology Graduate Student Organization! With the passing of another successful year, a new retinue of graduate students has stepped up to pilot the EGSO. We welcome the following elected officers to the following positions. For more information on the EGSO, officer responsibilities, or information on upcoming activities, please visit our website, sites.psu.edu/egso.

President: *Madalyn Meyers*
Vice President: *Sarah Isbell*
Secretary: *Makaylee Crone*
Program Committee Representative: *Vishnu Sankararaman*
Social Co-Chairs: *Elyse McMahon and Cat McClure*
Anderson Award Representative: *Noah Winters*
Webmaster: *Chad Fautt*
GPSA Representative: *Suzanne Fleishman*
Curriculum Representative: *Miranda DePriest*
Faculty Advisor: *Dr. Terry Bell*

New Ecology Student Introductions

Amanda Van Buskirk

M.S. Graduate Student
(Adviser: Duane Diefenbach)

I will be creating a spatially explicit model that simulates the dispersal movements of white-tailed deer to test the effects of localized management on deer densities as part of the Deer-Forest Study. In my spare time I enjoy doing yoga and reading mystery books.

Amy Wrobleski

Ph.D. Graduate Student
(Adviser: Rebecca Bird)

I'm a PhD student interested in human-dispersed plants on landscapes in Australia. I like to play Dungeons and Dragons.

Dominika Dec

Ph.D. Graduate Student
(Adviser: David Walter)

I work with David Walter on the West Nile Virus and Ruffed Grouse study along with the Pennsylvania Game Commission. I love to bake and I tend to bring in what I make into the office.

Fiona Lunt

M.S. Graduate Student
(Adviser: Marc Abrams)

We're researching climate drivers of forest change in the Eastern US, looking at a variety of past data sources and relating it to specific tree ecophysiology. In my free time I like to ski, hike, and hang out with the cats.

Walter D. Espíndola

Ph.D. Graduate Student
(Adviser: Tomás Carlo)

Broadly speaking, I am interested in frugivorous birds-plant interactions and its role maintaining diversity. Having been born and grown up in a megadiverse country in South America (Peru) certainly raised in me a profound interest and appreciation for nature. In my spare time I enjoy doing sports, hiking, photography and music (listening and playing).

Jen Nieves

M.S. Graduate Student
(Adviser: Kim Steiner)

I am working toward an MS degree researching the effects of disturbance on oak regeneration in PA. In my free time I enjoy hiking, dancing, and practicing photography.

Makaylee Crone

Ph.D. Graduate Student
(Adviser: Dave Biddinger and Christina Grozinger)
I am currently working on determining which components of pollen are important for honey bee health in order to develop a diet to increase pesticide resilience. During my free time I enjoy hiking, crafting, and spending time with my dog, Muffin.

Lauren Onofrio

M.S. Graduate Student
(Adviser: Laura Leites)

I am working on my M.S. in Dr. Laura Leites' lab where I will be modeling black walnut's radial and height growth responses to a changing climate using historic provenance test data. In my free time I enjoy hiking, biking, whitewater kayaking, and wishing I had a dog in State College!

Cat McClure

M.S. Graduate Student
(Adviser: Tyler Wagner)

I am a M.S. student in the Wagner lab studying the spatial and temporal variation of endocrine disrupting compounds in the surface water of the Chesapeake Bay Watershed. In my free time I love to ski, backpack, run and play soccer.

Caylon Yates

Ph.D. Graduate Student
(Adviser: Terry Bell)

I'm researching soil microbiome assembly and function. I enjoy long distance running.

Miranda DePriest

Ph.D. Graduate Student
(Adviser: Terry Bell)

My name is Miranda DePriest and my advisor is Terry Bell in Plant Pathology. I plan to investigate invasion ecology in soil microbes for my PhD. A fun fact is that I have three pet rabbits named Pancake, Peach, and Berry.

Suzanne Fleishmann

Ph.D. Graduate Student
(Adviser: David Eissenstat and Michela Centinari)

I am interested in the agroecological implications of perennial crop management and my PhD will focus on how belowground competition between wine grapevines and grass groundcover shift grapevine growth, root function, and rhizosphere microbial communities. In my free time I enjoy gardening and trail running with my dog.

Laura Jones

Ph.D. Graduate Student
(Adviser: Margarita Lopez-Uribe and Ruud Schilder)

I am a PhD student studying the effects of microclimate and pathogen load on the thermal tolerance of squash bee (*Eucera pruinosa*) populations.
In my spare time I enjoy creating insect crafts with other students in the Entomology Department, including crocheting butterflies and cockroaches!

Chad Fautt

Ph.D. Graduate Student
(Adviser: Kevin Hockett)

I'm looking how interference competition helps shape the community structure of the plant pathogen *Pseudomonas syringae*. Outside of the lab I fill my time trying to make art, programming, and getting woken up in the middle of the night by my cat.

"Chasing Coral" documentary screening and panel discussion with the Ecology program's Dr. Todd LaJeunesse, Iliana Baums, and other faculty about the current coral reef crisis, organized (and photographed) by Andie Chan.

Postdoctoral Reflections on Penn State

Kirsty MacLeod

Postdoctoral researcher Kirsty MacLeod. Photo Credit: Kirsty MacLeod

It's a rare and exciting sensation, to feel as though you've made exactly the right decision and are in exactly the right place - that was very quickly how I felt in the weeks after first arriving at Penn State in March of 2016 to begin a postdoctoral position with Michael Sheriff and Tracy Langkilde. I had never visited Pennsylvania before, or worked so far from my home in Scotland, but nevertheless felt hugely welcomed and supported, and fully embraced State College and campus life. Happy Valley quickly felt like home!

My project set out to investigate whether stress during gestation in *Sceloporus* lizards results in offspring themselves more resilient to stress, drawing on my previous experience in the areas of maternal effects, and introducing me to new themes and skills - stress physiology, and reptilian systems (which anyone who knows me will now know have totally won my heart!). To answer these questions, my postdoc fieldwork necessitated introducing me to another wonderful place - southern Alabama, where I spent two summers ("it's not the heat, it's the humidity") conducting large-scale experiments.

A young fence lizard (genus Sceloporus). Photo Credit: Kirsty MacLeod

Having the chance to explore the eastern United States, from Pennsylvania to the Gulf Coast, was a very happy bonus for a travel junkie. Our long hours of fieldwork in the beautiful longleaf savannah of the southern coastal plains is now coming to fruition, with two of my papers from these field seasons out this year: "Survival and reproductive costs of repeated acute glucocorticoid elevations in a captive, wild animal" in General and Comparative Endocrinology, and "Tree selection is linked to locomotor performance and associated noise production in a lizard" in the Journal of Zoology - lots more to come! Working alongside other Penn State colleagues in the field and in the lab back at Penn State (including Ecology grad students Dustin Owen and Braulio Assis) was a very great pleasure, and made the work-intense summer months go quickly and smoothly.

Throughout my time at Penn State I enjoyed a close association with the Ecology Graduate Program, from teaching the bright and brilliant incoming graduate class of 2016 (Advances in Ecology), to (enthusiastic) participation in Happy Hours and social events, including a fantastic retreat at Curt's, a baseball outing, and excellent picnics! My closest and most enduring friendships have come from within this happy group - I was lucky to be a part of it, and I'll miss the dynamic, supportive network of Penn State Ecology very much.

After leaving Penn State in October, I'm enjoying a couple of months of travelling in Australia, South Africa, and Scotland, before beginning a Marie Curie EU Commission fellowship in January that will be held jointly in Lund University (Sweden) and Simon Fraser University (Canada). With fieldwork in Tasmania, I'll be extending the work I've done at Penn State, this time focusing on how the postnatal social environment influences the outcomes of maternal stress, this time in Egernia lizards, which are semi-social. I hope that my continuing associations and collaborations at Penn State in Biology and Ecosystem Science will bring me back to State College during this fellowship in due course! Until then I encourage everyone to keep in touch. See you soon, Ecology!

Ecology graduate students Courtney Davis, David Muñoz, and Staci Amburgey present the "Newtiful Lives of Salamanders" at Big Springs Distillery's SciencePub event. Photo Credit: Robert Newton

Breaking New Ground: Soil Sampling Tree Tip-up Sites

Ben Dillner

Taking a shallow soil sample from a large pine tip-up mound. Photo Credit: Brosi Bradley

On August 19, 2017 there were severe thunderstorms that took down large numbers of trees in the Stone Valley area and Susquehanna Shale Hills Critical Zone Observatory. While the storms turned some areas into a tangled mess of brush, they gave me an excellent research opportunity and ultimately my Master's thesis project. Much research has focused on disturbance events in forests at the ecosystem scale, but studies looking at individual tree blow downs are lacking. In this case, many trees were torn out of the ground creating tip-up pits and mounds, which have fundamentally different characteristics than the surrounding forest floor. My thesis asks: do certain tree species preferentially colonize mounds and why? How does plant resource availability on the tip-ups change over time? What is the progression of soil profiles in tip-ups as they degrade to smooth forest floor?

It was easy to say I would take measurements at the tip-ups; it was another thing to actually take those measurements. We struggled deciding how to representatively sample the inverted, often crumbling soil in the pits and mounds. We had to get creative and employ several Kaye lab sampling techniques.

Using the slide hammer corer to sample a highly decayed conifer mound. Photo Credit: Madison Schaefer

To characterize nutrient availability, I placed a PVC quadrat (11cm diameter section of pipe) on the soil surface. I used a soil knife to remove the O horizon (if present) and then collect a 2cm deep sample of mineral soil. The mass of O horizon was determined and used to compare tip-ups of different ages to the control sites. Some of the

older pits had accumulated nearly 30cm of O horizon, which is much greater than the thin layer in most of the Shale Hills forest.

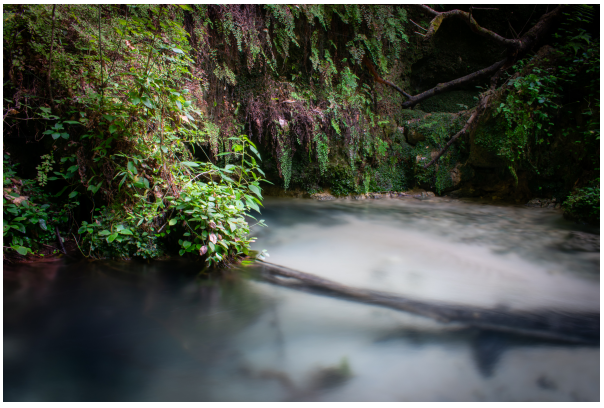
Mineral soil was extracted for nitrogen analysis, dried to determine water content, and sent off to Agriculture Analytical Services for the standard fertility test. In order to survey soil profile development on the tree tip-tips over time, I needed to take deep soil cores. But should the cores go straight down into the mounds or horizontally from the front? We decided to go straight down. We used a slide hammer corer (hammers a cylinder into the ground) to go the first 30cm. Then we used a bucket auger (collects a sample in a bucket that drills into the soil) to get to 50cm. Pounding into the newest mounds was a delicate balancing act since many had loose soil that wanted to collapse. For the pits, which were generally a jumble of shale, we opted to take a single sample using the slide hammer. The 50cm cores were divided into depth increments and in total there were 450 samples! We sieved all samples then measured rock content and soil organic matter. Soil organic matter was determined by baking the sample in a furnace and determining the mass lost.

Ultimately, I have learned a lot about the micro-environments that a fallen tree creates and how to sample them. Most importantly, I managed not to fall into any pits and only broke one slide hammer corer!

Suzanne injects stable isotopes of water to trace root water extraction of grape vines. Photo Credit: Michela Centinari

Andie Chan meets with nonprofits and congressional staffers to discuss science funding during the Penn State Science Policy Society Congressional Visits Day

A field technician's hand compared to a black bear print found while collecting phenology data near Shaver's Creek. Photo Credit: Steve Bean



Freshwater spring at a field research site, Solon Dixon Forestry Education Center, Andalusia AL. Photo Credit: Braulio Assis

Andersen Award Reflection

Courtney Davis

The St. Andrews, UK coastline. where the International Statistical Ecology Conference was first hosted in 2008. The conference celebrated its 6th meeting and 10th year of existence in St. Andrews in July.

The International Statistical Ecology Conference (ISEC) held its 6th conference in St. Andrews, UK in July 2018. Concurrent sessions revolved around the topics of integrated modeling, movement ecology, species distribution modeling, and community dynamics, to name a few. I presented a part of my dissertation research on the integration of occupancy and structural equation models to understand the direct and indirect impacts of extreme weather events on a coastal amphibian community. The discussions that followed this presentation shaped the current trajectory of this project. I am extremely grateful for the opportunity to share my work with a diverse, international audience and receive feedback from some of the leading experts in the field of statistical ecology.

In addition to research talks, ISEC hosted a public lecture for the local community entitled 'Counting on Conservation.' The lecture consisted of two talks that honed in on the importance of sound science and the use of statistics in the creation and achievement of conservation goals. The speakers were engaging, their presentations were elegant, and their message was simple, yet so critical. The audience, which consisted of both ISEC attendees and members of the St. Andrews community, followed up with great questions about how they could learn more and become involved with some of the research initiatives highlighted by the speakers. This was, by far, the best public lecture I have seen, and really motivated me to think about how best to engage the public in our research endeavors and why it is so critically important that we do so.

Halfway through the week, conference attendees were encouraged to leave behind the equations and participate in one of three different afternoon excursions. Naturally, I chose the hike along the coastal path linking Crail to Anstruther. The views along the trail were stunning, especially because many of the wildflowers were in full bloom. We ended the hike in the small fishing village of Anstruther, home of the Scottish Fisheries Museum (which I would highly recommend) and breathtaking views of the Firth of Forth's northern coastline. While we did not see the puffins or grey seals we were promised, this was certainly an experience I will never forget.

The beautiful fishing village of Anstruther, UK, and the final destination for our coastal hike from Crail.

I would like to thank Frank A. Andersen, the Andersen Travel Award Committee and the Ecology Program for their support. Because of this support, I was able to strengthen existing partnerships, build new international friendships, and learn about the recent advancements in statistical ecology from the experts themselves.

Andersen Award Reflection

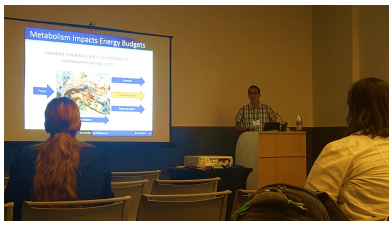
David Muñoz and Staci Amburgey

This year, both of us were granted Andersen Award money to attend The Wildlife Society annual meeting in Cleveland, Ohio. It was a great combination of scientific talks, professional development, and networking. It was also fun to share the experience with several other Penn State Ecology graduate students, with it being several students' first large scientific meeting and it being Staci and David's last Wildlife Society Meeting as members of the Miller Applied Population Ecology lab. Below are some reflections from each of us.

Happy faces at the end of The Wildlife Society national conference

David: This was my fifth time presenting at The Wildlife Society annual meeting, but it was my first time presenting results on how salamanders will adapt to climate change. Using physiological methods, we found that some populations are more sensitive to warm conditions than others, and this is useful for evaluating the utility of climate adaptation management actions like assisted migration. Despite presenting on the afternoon of the last day, I was excited to have my talk well attended.

This conference was also helpful for networking. I reconnected with past collaborators and supervisors, and I solidified connections with folks who I am interested in working with in the future. I would like to thank Dr. Frank Andersen and the Andersen Award Committee for helping me attend this conference. As I begin to look at what's next, having a stronger network will help create opportunities I am interested in.



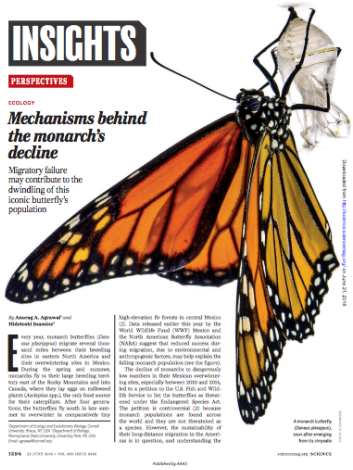
David blowing the crowd's mind on the impact of climate change on salamander metabolism

Staci: I was excited to be attending the annual meeting as an invited speaker for a symposium on modeling techniques that account for our inability to perfectly detect species and thus better model wildlife responses. While I've been lucky to present at TWS in years past, this was only the second time I've been invited to participate in an organized symposium. In between my excitement to be sharing the room with researchers whom I admire, I was also happy to be sharing results of the final chapter of my dissertation for the first time at a conference. People were interested in hearing about how urbanization impacts the species richness of vertebrate communities, and I was delighted to talk to many researchers after my talk and in the subsequent days about how they're interested in similar questions and approaches. The Andersen Award was integral to my ability to attend this meeting and allowed me to network at the end of my Ph.D. (a rather important juncture in my career). My thanks to the Ecology program and Dr. Frank Andersen for this opportunity.

Andersen Award Donation Information

If you are interested in donating to the Ecology Program and seeing your contribution help graduate students who have achieved excellence in the research topic in Ecology attending professional conferences in their field of study, please visit raise.psu.edu/AndersenTravel.

Ecology Program Recent Publications


INSIGHTS

PERSPECTIVES

ECOLOGY

Mechanisms behind the monarch's decline

Migratory failure may contribute to the dwindling of this iconic butterfly's population

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chemical signals in mediating social interactions in honey bees (*Apis mellifera*) *Journal of Chemical Ecology* 44:1-8.

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Ecology Program Recent Awards

Staci Amburgey received the Ecology Andersen Travel Award and Pennsylvania Space Grant Consortium NASA Fellowship.

Andie Chan announced as John A. Knauss Marine Policy Fellow.

Makaylee Crone received a National Science Foundation Graduate Student Fellowship.

Courtney Davis received the Ecology Andersen Travel Award and the Russel D. and Gloria T. Harrar Scholarship. The Harrar Scholarship is awarded to a student in order to design, plan, and teach a course.

Carli Dinsmore received the Roger M. Latham Award for excellency in conservation outreach and education.

Sarah Isbell received 2nd place in the graduate student oral presentation competition in the Cover Crop Community of the American Society of Agronomy at the ASA, CSSA, and CSA International Annual Meeting.

Melanie Kammerer-Allen received an USDA-AFRI-ELI Predoctoral Fellowship and USDA NE SARE Graduate Student Award for designing farms that support wild bees.

Rondy Malik, *David Muñoz*, and *Asia Murphy* announced as Alfred P. Sloan Minority Ph.D. Program Scholars and attended the 25th annual Institute on Teaching and Mentoring.

David Muñoz received the Ecology Andersen Travel Award.

Ted Primka received the Environmental System Science PI Meeting Student Travel Fellowship Award

Vishnu Sankararaman received a grant through the Rufford Small Grants for Nature Conservation.

Dr. Margarita López-Uribe received the Early Career Professional Research Award from the Entomological Society of America.

Dr. Christina Grozinger announced as Elected Fellow to the Entomological Society of America. She also received a Penn State Outstanding Postdoc Mentor Award.

Dr. Kat Shea announced as Fellow of the American Academy for the Advancement of the Sciences. For more information, science.psu.edu/news-and-events/Shea11-2018.

Dr. Doug Sponsler received an USDA-AFRI-ELI Postdoctoral Fellowship for Strengthening urban apiculture, crop production, and biodiversity by understanding the habitat needs of wild and managed bees.

Congratulations to *Tarik Acevedo* and *Elyse McMahon* who passed the Ecology Qualifying Exam!

Congratulations to *Tim Gould* who recently defended his Master's theses and *Katy Barlow*, *Andie Chan*, *Chad Nihranz*, *Shauna-Kay Rainford*, and *Will Miller* who recently defended their dissertations!

Call to IGDPE Alumni!

Are you an IGDPE graduate? Please reconnect with us and let us know what you are up to these days. Email Jean Pierce, jep32@psu.edu, with a quick summary and to say hello!