

PITTSBURG STATE UNIVERSITY

BIOLOGY NEWS 2023

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It has been my privilege to serve as Interim Chair of the Department of Biology for the last two and a half years. During that time, I've been thrilled to learn many of the ways that the Biology Department positively affects the environment and the health of our region. The department is home to some truly memorable individuals. During my time as interim chair, the department has maintained some long-time strengths (Nature Reach and the Natural History Reserve), created some new partnerships (a connection with the new medical school in Joplin), and taken part in a new program that will count tagged birds as they fly

A Word from the Chair

through our area (the Motus program). These have all been done by members of the department without my help. They've done it on their own and are to be commended for taking such leadership roles.

In addition to these, the College of Arts and Sciences has upgraded the Human Dissection Lab. While this facility and the class associated with it are already an asset unique to a school of our size, this improvement takes it to another level. While the leadership and funding were provided by the College of Arts and Sciences, I am pleased it happened on my watch.

All of this to say, that I am stepping out of this role at the end of the Spring semester and will be returning to the classroom. All of the special things that Biology takes leadership in like Science Day will continue, as there is strong leadership within the department, but someone else will have the honor of chairing this marvelous group of people.



Biology Instagram

Student Erik Jantz presented his poster at Ar-INBRE, October 2023



Dr. Christine Brodsky



Top:
Khloey Stringer, Alesha
Lawson, and Dr.
Brodsky deploying
game cameras for the
fifth year of Snapshot
USA, a nationwide
camera-trapping project
run by the Smithsonian.

Bottom:
An urban bobcat with a
mouth full of gray
squirrel, captured on
our Snapshot USA
game cameras in
Pittsburg



Another year has flown by at Pitt State! Once again, I was lucky to have a wonderful group of students this year for Urban Ecology, Animal Behavior, Ecology & Field Biology Orientation, and Environmental Life Science. Many students from my Urban Ecology course ended up presenting their independent research projects on an urban ecology topic at the PSU Research Colloquium in April, which was really exciting to see.

Students in the Brodsky lab have once again been incredibly productive in their research panning wildlife ecology topics in Kansas and beyond. Our big project at the moment is our statewide spotted skunk survey, which we are wrapping up data collection and analysis. Sadly, we did not detect a single spotted skunk after surveying 609 locations across 18 Kansas counties; however, we did detect four mammal Species in Need of Conservation. Of these detections, we reported two county records for gray fox, which is now in press in *Transactions of the Kansas Academy of Science*, authored by Daniel Benson and Jenell de la Peña. We also continued collecting camera trap data with Snapshot USA – our fifth year of sampling Pittsburg! Ten students (7 undergraduates, 3 graduates) presented their research as oral and poster presentations at conferences like KNRC, The Wildlife Society, International Mammalogical Congress in Alaska, and more.

Jenell de la Peña successfully defended her thesis “Characterizing the ecology of Plains (*Spilogale interrupta*) and Eastern (*Spilogale putorius*) spotted skunks: A systematic literature review and population assessment in Kansas” in November 2023. Luke Headings (co-advised with Dr. George) successfully defended his thesis “Evaluating bird and vegetation communities on mined lands in Southeast Kansas” in April 2023 and now works for KDHE’s Surface Mining Unit. MS alumna Emma Buckardt (2022) published her first of three thesis chapters this year in *Wetlands* and she is now serving as a Research Scientist I - Wildlife Ecologist at Iowa State University. Kudos to the recent grads and their work to get their theses published!

It has been a privilege continuing to serve as the K-INBRE Campus Coordinator for a fourth year, working with our exceptional K-INBRE Scholars and faculty mentors. This past year was a busy one for K-INBRE, preparing our NIH renewal packet for another five-year grant. In 2023/2024, the faculty and 14 student Scholars were awarded \$88,000 to conduct research. We recently welcomed Dr. Christopher Ward (Biology) and Dr. Paige Boydston (Psychology) as new K-INBRE Mentors. I am looking forward to spending the upcoming Spring 2024 semester on sabbatical. My plans are to finish writing some papers that have been sitting on my desk for far too long and spending some time at the University of Helsinki collaborating with colleagues. More on that in the next newsletter!

Dr. Peter Chung



Classes have kept us busy, in the classroom, research lab and the prep lab. We welcomed Jean and McKenzie into the prep lab this summer. Big thanks to them for learning and training on the go, while keeping the prep lab going strong with all of the department's needs. It has been a pleasure working with you on a daily basis.

On the research side, our lab has had another productive year following our large collaborative grant (administrative supplement) back in 2021 and a presentation featuring our collaboration with Dr. Nick Wallace and his lab at Kansas State in 2022. Our collaboration has led to a publication in the journal *Gene*, titled "Inhibition of p300 increases cytotoxicity of cisplatin in pancreatic cancer cells". We appreciate the efforts of K-INBRE and our K-INBRE coordinator (Christine Brodsky) to not only support undergraduate research and encourage collaboration, but also highlight our successes, in face of little to zero recognition at the department or university level. Carlie is wrapping up her Star Trainee training and is interviewing at various graduate programs; we are proud of her work in our research lab and wish her the best in her future endeavors. Our graduate student total is now up to 3, with all 3 of them working on a professional Master's, in anticipation of getting into professional school.

We still get much interest in our programs from students throughout the state as well as surrounding states; we continue to meet with prospective students in hopes of an upward trend of increasing enrollment in our department. Meanwhile, our pre-professional program acceptance is gradually rising to prominence again after several down years. We have noticed that more quality, personal advising and mentoring, not only from faculty but also key juniors and seniors and our new Science academic advisor, has done wonders for opening the eyes up of our freshmen and sophomores to increase retention and success. This coming summer/fall will feature a bumper crop of our graduates into professional schools as a result of improved mentoring efforts.

Remote meetings seem to be the new norm now. Between Transfer & Articulation Council meetings of the Kansas Board of Regents to commencement committee meetings to some university meetings, Zoom and Microsoft Teams continue to be part of our daily fabric. We were pleased to see commencement back to a full in-person experience, not only for the graduates but also for the many loved ones attending and celebrating with them. This year will mark the 19th year serving as a commencement marshal. I am always excited to see and greet them as they await crossing the stage and look forward to many more ceremonies.

As many events have gotten re-established in the last few years following the pandemic, we have evaluated and shifted some of our recruitment priorities. We plan on taking students to visit various PT Schools, so those of us specifically involved in PT advising look forward to the trips. The Biology Club reaffirmed its willingness and commitment to continue planning and having Science Day, so I have decided to continue advising the Club and coordinating Science Day. I look forward to working with some of my colleagues in Biology, Chemistry and Physics to put on a good show for our regional high school students and sponsors.

To all our graduates, colleagues and friends whom I have had the pleasure of mentoring, collaborating and interacting with, over the years, do not be strangers; stay in contact, keep in touch, and do visit with us when you get a chance. You do us proud. Be well and stay safe.

Regards,

Dr. Peter Chung (pchung@pittstate.edu)

Dr. James Whitney

Like most years, 2023 was a year of beginnings, endings, and everything in between.



During 2023 Josh Holloway began his thesis research under my advisement. The objective of his project is to assess the current prevalence freshwater mussels in the Spring River of southeast Kansas, and to compare this data with historical information. We are doing this because there is preliminary data to suggest that mussel populations in the Spring River have plummeted over the last decade, potentially as a result of ammonia pollution. Josh, with the help of Hunter Hinds and myself, completed his first year of mussel sampling and ammonia collections during 2023. Although densities were low throughout the Spring River compared to historical observations, we still found many imperiled mussels, including the federally-endangered Neosho Mucket, federally-threatened Rabbitsfoot, the Western

Fanshell, which is a candidate for federal listing, and the state-endangered Elktoe. Josh will continue this sampling in 2024.

In terms of finishing projects, Blake Hansen successfully defended his thesis on April 4th. His thesis sought to compare different types of backwater habitats in their ability to function as nurseries for federally-endangered Colorado Pikeminnow and Razorback Sucker in the San Juan River of the Four-Corners region. After defending Blake quickly landed a job as a fisheries biologist with the Utah Department of Natural Resources in Moab, UT.

More local research in 2023 included completing our third year of stream fish sampling at Prairie State Park, MO and our second year of sampling in Elm Creek at Lehigh Portland State Park in Iola, KS, which is the newest state park in KS. These are hopefully both the beginnings of what will become two long-term datasets.

During 2023 we virtually attended the 43rd annual Upper Colorado and San Juan River Recovery Program Researcher's meeting, and attended in person the Kansas Natural Resources Conference in Manhattan, KS, the Midwest Fish and Wildlife Conference in Overland Park, KS, and the San Juan River Basin Recovery Program Biology Committee meeting in Durango, CO. We gave a variety of oral presentations at these conferences.

Over spring break I took Annika Anzjon, Talya Crouch, Kit Garvin, Miranda Hallacy, Maggie Saul, and Jossie Shumaker down to South Padre Island, TX so that we could volunteer with Sea Turtle Inc. to help them prepare for the upcoming nesting seasons of the Kemp's Ridley and Green turtles. We accomplished this by repairing a corral where they re-locate sea turtle nests so that eggs can hatch safely without the risk of predation and destruction from human activities. This was a joint trip taken with Emporia

State University, whose group was led by Dr. Rachel Bowes. This trip was initiated several years back by Judy Scherff of Washburn University, who is a PSU alumna. We are in the planning stages of repeating this trip during spring break of 2024.



In the spring I taught Ecology, Marine Biology, and Biometry, and during the fall I did Ecology, Environmental Life Sciences, and Stream Ecology.

Scenes from 2023 Stream Ecology field trips

Dr. Philip Harries



Top: PSU alumni and students attended the Ribbon Cutting Ceremony for Kansas City University College of Dental Medicine in Joplin, MO. Dr. Alex Talbott, D.D.S., Dr. Mandy Peak, Brock Marquardt & Mattie Flanagan (senior PSU pre-dental students), Max Sheffer & Preston Sweaney (inaugural class of KCU dental students), and Dr. Josh Sweaney, D.O.



Greetings from Heckert-Wells. It's definitely been another busy year! In the classroom I've been continuing to teach Principles of Biology I, Introduction to Research, Biology of Cancer, Bioethics, Virology, and Pre-Health Orientation I. I have had some particularly fun and interactive groups of students in my classes this year which has definitely kept things exciting.

On the research front, I presented the combined work of two recent graduate students, Mary Gathoni and Devapriya Sagarán at the Regional INBRE meeting in Kansas City in June (See picture below). Their work examined the ability of three plant derived polyphenols to kill lung and pancreatic cancer cells. During the fall semester I began working with three new students (Graduate student Silas Rosiere, Senior undergrad Christopher Simmons, and freshman Sara Akhtar) on a research project dealing with oncolytic viruses capable of killing cancer cells. We are focusing on viruses that might be used to target head and neck squamous cell carcinomas with the goal of identifying expression patterns of viral receptors that may indicate which of the many oncolytic viruses available might be best suited for targeting this specific type of cancer. We are still in the early stages of this work but plan to present an overview of our progress at the annual K-INBRE symposium in January 2024.

A high point this year is that I was fortunate to be involved (along with Dr. Mandy Peak) with helping to expand our existing early admission program agreement between PSU and Kansas City University's medical and dental schools in Joplin. More details on this should be made available in the coming months but I am excited by the prospect of how it will help expand our pre-med and pre-dental programs to the benefit of our students.

On a personal note, my oldest son is currently a senior finishing his computer engineering degree at K-State. His younger brother is a junior here at PSU studying art and music. My wife Kimberly, who works in the music department at PSU has been busy with her home baking business (Bee Kind Bakery) on the weekends. I've still been running consistently in my free time and am hoping that it may be possible to participate in some races in 2024. I hope everyone is doing well and best wishes to all for a healthy and happy.



Regional INBRE PSU attendees (L to R) Dr. Anu Ghosh, Dr. Christine Brodsky, Dr. Phillip Harries, Dr. Peter Chung, Undergraduate Carlie Payne

Dr. Andrew George



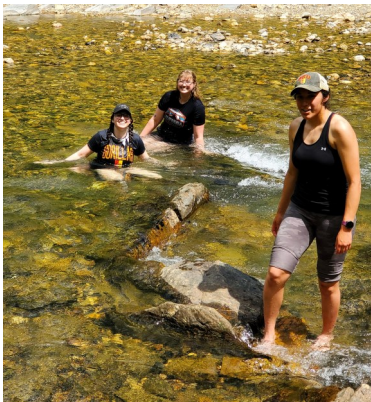
Here are a few highlights from 2023.

The Herpetology class field trip was one of the most fun and exciting events of the year. We spent four days in April visiting remote locations in the Ouachita Mountains to study endemic salamanders and other unique species. Similar to 2022, this year's class was the largest on record for PSU, and we had to open a second section to accommodate – a trend that reflects the growing popularity of our field classes. The Herpetology class trip has become one of the most memorable, and formative experiences for our field biology students during their time at PSU.

Several of our outstanding graduate students completed their thesis projects in 2023, including Luke Headings (from Ohio; co-advised by Dr. Brodsky) and Haley Price (from Tennessee), who studied habitat relationships in birds and bats, respectively. Luke is now an Environmental Specialist for the KDHE Surface Mining Unit, and Haley is the USGS technical liaison for the North American Bat Monitoring Program. Congrats to Luke, Haley, and all of the other PSU grads for your accomplishments!

The Kansas Motus Project has continued to grow, with generous financial support from several private donors and grants. Motus is a collaborative network of automated telemetry stations for tracking movements of migratory animals. We now have 20 operational Motus stations in Kansas, with several more planned for 2024! So far we have detected birds passing through Kansas that were originally tagged as far away as Illinois, Montana, and British Columbia. In October, we attached Motus transmitters to 20 Gray Bats to track their fall migration to caves in the Ozarks. Check out the [Kansas Motus Project webpage](#) for more exciting updates.

In fall 2023, PSU became the first Kansas university to partner with Delta Waterfowl in their University Hunting Program. This program is designed to acquaint non-hunting students from wildlife degree programs with hunting. One goal of the program is to better prepare future wildlife management professionals for careers with natural resource agencies. The students complete a Hunter Safety course before participating in a mentored hunt. Our inaugural class has 12 students and so far the experience has been lots of fun. Stay tuned to learn how the semester went!



Above: Herpetology students Isabelle Villafañe, Khloey Stringer, and Konya Halle at the Little Missouri River in Arkansas

Right: Wildlife Management students catch turtles at the Buche Wildlife Area



Dr. Anuradha Ghosh



I wish to share some highlights of another exciting year!

A new prep - Epidemiology! Dr. Dawson taught this course for years in the past. I am happy to take over the role and teach this course every spring. In post-COVID era, there is a need for Public Health Professionals across the nation. In view of this, we designed a Public Health Certificate, in collaboration with the Nursing department and legislated it this fall. This certificate supplements our existing Public Health Minor. The course listing is here: <https://registrar.pittstate.edu/catalog/current/interdisciplinary-programs/public-health-certificate.html>

This fall, we made an informational visit to Baxter Spring High School and made a fruitful connection. My colleagues and current students interacted with aspiring junior and senior students. We were delighted to meet with the teachers who were PSU Biology alumni.

Ms. Bobbi Monroe defended her research thesis in August and is working for Stantec as a Biology Technician surveying *bat fatalities* at commercial wind energy facilities. She plans to pursue a Ph.D. program and to continue working with bats in some capacity. She received the Best Graduate Poster Award at the Kansas Academy of Science Annual Meeting held at McPherson College, KS in April. The bat metagenomics data is further being analyzed by Ms. Ayushee Dasgupta, who is a KINBRE Bioinformatics Scholar this year.

Bobbi and Ms. Danielle Evilsizor did an excellent job as the Graduate Teaching Assistants for General Biology Lab over two years. Two new graduate students are on board to teach the lab: Mr. Brayden Letterman and Mr. John Bear. Both did a commendable job teaching their first semester!! Way to go...

Brayden worked on the NSF-EPSCoR funded tick project as an undergrad researcher and is continuing working with ticks as a GTA in the lab. I am grateful to have very motivated undergraduate researchers, Mr. Erik Jantz and Mr. Debmalyo Rudra Sarma, working in the field as well as in my laboratory this year on a research contract funded by Kansas Department of Health and Environment. Erik and Brayden presented posters at the Arkansas INBRE Conference at the University of Arkansas (Fayetteville, AR) last month, and also attended a workshop at the conference. Our summer tick research was highly publicized by various media. Please see page for links to sites.

Our lab recently secured a National Institute of General Medical Sciences - KINBRE Team Science funding in with KUMC, which involves undergrad and graduate students and investigates the role of gut microbiota in the development of chronic abdominal pain. I currently have Mr. Levi Carrico as a GRA on this project.

Success of our mentees always make us proud. My previous undergrad researchers: Ms. Madison Reese joined OSU College of Osteopathic Medicine this summer; Ms. Niamh Dixon is pursuing Masters in Public Health at the George Washington University Milken School of Public Health starting fall; and Ms. Alexis Paynter is attending Kansas City University of Medicine and Biosciences (KCUMB) Graduate Program since spring this year. Wishing you all the best!

Lastly, on behalf of our departmental scholarship committee, I would like to reach out to all our alumni and well-wishers for the purpose of recruitment and retention of students with biology major. Any support in terms of scholarship/gift is highly appreciated. Please feel free to contact me (aghosh@pittstate.edu) or our chairperson (bwinters@pittstate.edu) if you need any information. Bettie A. Duncan Biology Scholarship and Dr. Lee S. Hornstein Scholarship: these two new pre-med scholarships have been established this year. Our sincere gratitude to the donors!

It was a pleasure to serve on the search committee to fulfill the position of a Human Physiologist. Welcome on board, Dr. Chis Ward! We are happy to have you join our team. As always, special thanks to Libby and Savannah for hosting such a fabulous Holiday Party. We appreciate all you do for us and the Departments.

Wishing our Biology friends and families a Prosperous New Year!



Dr. Neil Snow

I taught seven classes, including (for the first time in several years) *Plants and People*. An unscientific taste test therein of eight apple varieties (n=11) demonstrated that Honey Crisp, Granny Smith, and Gala were among the most *and* least favorites among participants.

Dr. Brodsky and I took several students to George Washington Carver National Monument in September. Tabitha Caruthers, Alaina Fulkerson, Jessi Snow and I were in St Louis during Spring break for tours of the Danforth Plant Science Center and Missouri Botanical Garden, the latter including a 3-hour service project sorting plants with staff members.

With support from K-INBRE, Clarissa Wedman analyzed patterns of leaf venation among members of the woody genus *Uromyrtus* from New Caledonia. Her research may reveal traits in leaf venation that help to differentiate between morphologically similar species in this taxonomically difficult genus. She presented at the K-INBRE conference in January 2024.

I served on two Master's committees in the Department of Music for Thomas Smith and Colton Shockley; congratulations to both for their performances and theses.

The Sperry Herbarium was active. We documented one state record (Idaho) and about 15 county records. I sent over 100 leaf samples for DNA extractions, including *Eugenia* of Madagascar to Dr. Mariana Bunger (Universidade do Cear, Brazil), from New Caledonia to Dr. Thais Vasconcelos (University of Michigan), and a specimen of *Salvinia* to Dr. Brittany Sutherland (George Mason University). Michael Daines georeferenced about 1200 specimens. We mounted 1700 specimens and refiled about 4000. (See the Herbarium 2023 newsletter for additional details: [2023-ksp-newsletter.pdf \(pittstate.edu\)](https://pittstate.edu/~ksp/newsletter/2023-ksp-newsletter.pdf)).

Our Departmental seminar series had ten external seminar speakers in 2023, hailing from Kansas, Missouri, Oklahoma, Texas, and Illinois. Topics included insect taxonomy, careers in agricultural extension, environmental remediation, herpetology, invasive grasses and fire ecology, wetland ecology, and leprosy.

Congratulations to Michael Daines and Danielle Evilsizor on the successful defenses of their Masters' degrees this year. Michael works for the US Forest Service in Idaho. Danielle presented a poster recently in Rolla at the Missouri Native Plant society meetings.

A new service component on campus is with the Committee for Sustainability. I continue as a member of the Weed Management Board of Lewis and Clark County, Montana.

In June I spent five weeks in Paris and Geneva working on the systematics (mostly) of *Eugenia* from New Caledonia. Collaborators and I have about 25 new species to describe in three genera. Dr. Sarah Jacobs (California Academy of Sciences) and I co-organized a workshop at BOTANY 2023 in Boise in July to summarize all new plant species described in North America over a 25-year period.



Finally, my thanks to Libby Graham for taking over primary duties on assembling and editing this newsletter.

Left: Rylan Mason collecting Plants in Missouri, where in about four hours we documented four county records, including the first of the invasive shrub Amur honeysuckle (*Lonicera maackii*).

Dr. Mandy Peak Bryan



Hello Gorillas! I am pleased to report we had a successful year for students applying to professional schools. The following students started school in 2023: Trinity Dobbs (UMKC-School of Medicine), Aaron Higginbotham & Braden Shelton (KU-School of Medicine); Madison Reese & Ali Vanzant (OSU-College of Osteopathic Medicine); Spencer King, Noah Daly & Ilyanna Knopp (Arkansas College of Osteopathic Medicine); Kinsey Morrey & Marissa Vail (KCU College of Medicine); Isabella Friemel (UMKC School of Dentistry); Max Sheffer, Preston Sweaney, and Aaron David (KCU College of Dental Medicine); Cheyla Myrick (K-State College of Veterinary Medicine); Avery Altman (Sonoran Uni Health Sciences), Madison Morris (Northeastern State University PA School), Isabelle Schmidtberger (South University MMs Anesthesia), Quinn Smith (OSU Grad Certificate Medical Sciences) and Niamh Dixon (George Washington University MPH).

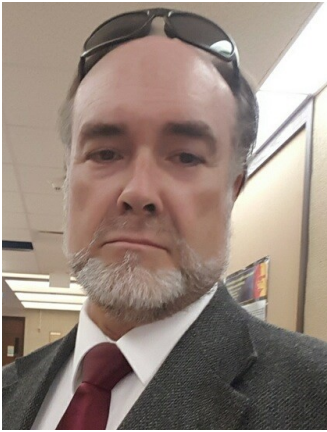
Also, biology students Hannah Eckstein & Riley Johnson were accepted into the KU Scholars in Rural Health Program. Several of our senior pre-health students have been accepted into various medical, dental, and PA schools and others are awaiting acceptance notifications in March. We will update you next year on the students' decisions!

Here's a story about Simon, Ryan, and Aaron Higginbotham, that by the end of this decade the three Pittsburg brothers will be doctors, following in the footsteps of their dad, also a doctor — and all four began their education at Pitt State. <https://rb.gy/xpwmzu>

Finally, several of our Pitt State Biology alumni graduated from professional schools in 2023, including: Dr. Madison Belew (ARCOM DO), Dr. Alexzandra Blanchard (Burrell College of Osteopathic Medicine), Dr. Blake Burrows (OSU DO), Dr. Kiralyn Mosier (UMKC dental), Dr. Wyatt Osterhage (KU MD), Dr. Mallory Parsons, (OU MD), Dr. Sasha Pashchenko (Dartmouth Geisel School of Med), Dr. Ethan Powell (UM St. Louis Optometry), Dr. Sierra Schupbach (OSU DO), and Dr. Tyler Shelby (Yale MD/PhD). Also, Kaci Hultz (Missouri State) graduated with her MS in Physician Assistant Studies & Andrew Andoyo (UMKC) graduated with his MS in Anesthesia; Sam Bollinger (Missouri State), Abby Denton (Missouri State) and Adam Martinie (St. Mary) graduated with their Doctor of Physical Therapy; & Victoria Murdock (Cleveland Chiro) and Benjamin Kelm (Cleveland Chiro) graduated with their Doctor of Chiropractic. We are proud of our Gorillas!

Dr. Virginia Rider—thank you for a fantastic 23 years at Pittsburg State University. Dr. Rider is pictured with PSU students and alumni at her retirement celebration.





Dr. Hermann Nonnenmacher

From 2021 to 2023, four undergraduates worked in my lab on a study investigating causes of mortality, in an urban setting, in the Polyphemus silkmoth (*Antheraea polyphemus*). Cocoons were collected for a few years and then sorted into groups, one of which indicated successful emergence of moths, or, alternatively, several groups indicating various mortality factors that killed cocooned larvae or pupae.

The students analyzed 159 cocoons, of which 52% indicated a successful emergence of an adult, with about 25% of those cocoons exhibiting other damage to the cocoon occurring after moth emergence. Damage to cocoons in which the adults did not emerge was attributed to (1) viral, bacterial, or fungal disease, (2) parasitoids belonging to fly and wasp groups, (3) predation by rodents, especially tree squirrels, (4) falling onto sidewalks and streets, and (5) being driven over by automobiles or hit by lawnmower blades.



Two of the students presented the work of the four at our PSU Research Colloquium in spring, 2023. More students that wish to join the lab will continue working with this, and other, silkmoth species that occur locally, to study year-to-year impacts on their populations.

Left: Dakota Herman (left) and John Jameson (right) presenting their research poster at the PSU Research Colloquium, Spring 2023.



Left: Brazilian MS alums Fabio Giacomelli and Natalia Agostini Schneider, currently doctoral students at St. Louis University, visited campus in October and joined Dr. Snow for dinner.

Ms. Delia Lister

Hi everyone!

Perhaps the biggest news for Nature Reach in some time is that we were able to join a grant with the Kansas Association for Conservation and Environmental Education. The grant was awarded, and we are lucky enough to have a full time Ameri-Corps member. Gizele Sisson, a recent biology graduate and long-time student worker was hired in September. She has jumped in with both feet and it has been wonderful having her here. She is getting tons a great experience and having the extra set of hands on a regular basis is certainly a game changer.

Summer 2023 was busy as per usual. I taught ELS as well as ran summer camps. My summer intern was Kate Tyree, and I probably would not have been able to make it through the summer without her help. Kate also recently attended the National Association for Interpretation (NAI) annual conference in Little Rock, Arkansas. When I was a student, one of the things that was especially meaningful was being able to spend time at conferences and network with people from both across the state and the nation. I'm glad to be able to share that experience with my own students.

I have one more year to serve as the President of the Kansas Association for Conservation and Environmental Education (KACEE). This organization is doing such wonderful for in environmental education and I am so happy to be part of it a national leader in the profession. I'm also now into my second year as Commissioner for Kansas Department of Wildlife and Parks. I have learned so much over the last year and I hope I can continue being of service to the agency.

I am always on the hunt for grants and outside funding to keep Nature Reach going. I hope you will consider donating to the program. For more information you can always visit our website: www.pittstate.edu/naturereach. This program wouldn't have existed for the past 39 years without the generosity of donors!



2023 Spring River mussel sampling. Top left: Alex King, Hunter Hinds, and Josh Holloway search for mussels. Bottom left: Josh Holloway measures water velocity in a sampling quadrat while Hunter Hinds searches for mussels.

Nature Reach 2023 Fall Nature Reach Staff holding various Nature Reach Animal Ambassadors.



2023 Activities



Left: Dr. Snow gave a tour of the Sperry Herbarium to Upward Bound students from Missouri.

Right: Dr. Peak and Biology majors traveled Spain with PSU Honors College Study Abroad trip. Our students practiced their Spanish and learn about Spanish history and culture.



Left: Students enjoying their spring break trip to South Padre Island, TX, which included a boardwalk hike along the Laguna Madre Nature Trail (left), a relaxing lunch on the beach (top right), and a dolphin boat tour (bottom right).

2023 Activities

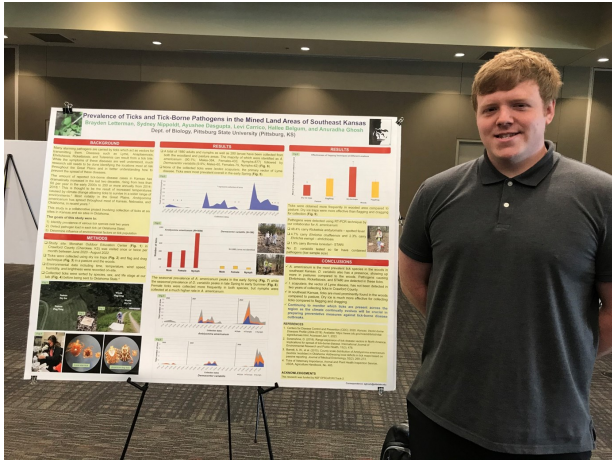


Left: Students in Dr. Whitney's Stream Ecology class processing aquatic macroinvertebrate samples collected from field trips earlier in the Fall 2023 semester.



Baxter Spring High School Visit, October 2023.

2023 Activities



Left: Brayden Letterman presents his poster at the April 2023 PSU Colloquium.

Right: Niamh Dixon and Madison Reese Present an iPoster at KINBRE in January, 2023.



Below: 12 PSU students participated in Delta Waterfowl's University Hunting Program. Half of the group here, from left to right: Bella McMahon, Khloey Stringer, Leann Trout, Renee Trout, Alesha Lawson, Heather Burrow.



2023 Activities

Right: Graduate Student Bobbi Monroe takes 1st place for Graduate Poster Presentation at KAS Meeting, April 2023.



Left: Clarissa Wedman, Belle Pfeiffer, and Khloey Stringer collecting plants in Oklahoma.

Right: Students Brayden Letterman and Erik Jantz doing Field Work on Dr. Ghosh's tick project during the summer of 2023.



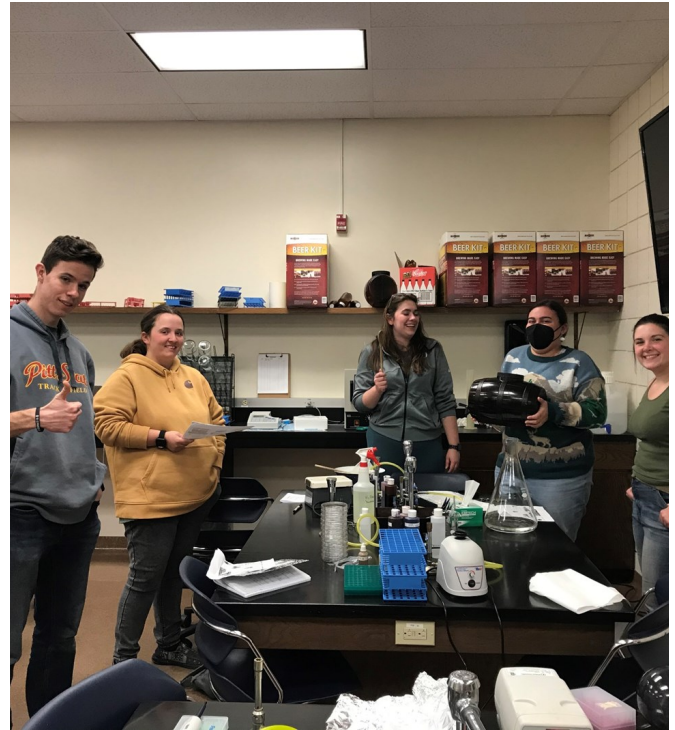
Left: Undergrads Heather Burrow and Khloey Stringer after a frigid morning in the duck blind, part of Delta Waterfowl's University Hunting Program.

Right: Three Virginia Opossums observed during the Kansas Herpetological Society Spring Field Trip



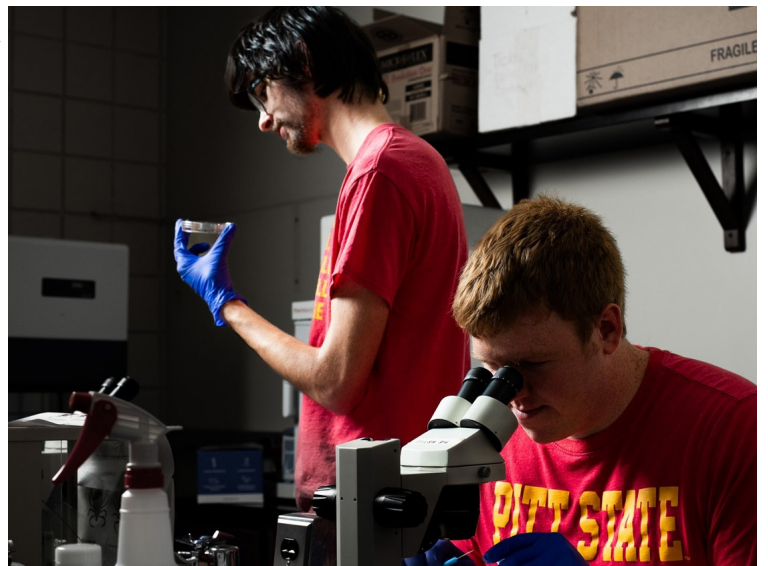
Activities 2023

Right: Students in Dr. Ghosh's Microbial Physiology class brewing beer.



Left: Dr. Ghosh represented Biology Department along with undergraduate students Ashlyn Potter, Marissa Vail, Corey Humble, Madison Reese, and Niamh Dixon at the Health Occupations Students of America (HOSA) - Future Health Professionals Conference held at Pitt State in March this year.

Right: Students Erik Jantz and Brayden Letterman doing Tick-Born pathogen research in Dr. Ghosh's lab.



Left: PSU students work with colleagues from Missouri State University to attach Motus tags to bats

Learning Through Experience



Left: Biology student presenters at the 2023 PSU Research Colloquium.

Below: A swift fox, captured on a game camera in Finney County set by MS students Daniel Benson and Jenell de la Peña. The swift fox is listed as a Species of Greatest Conservation Need for the state of Kansas.



Left: Students, faculty and alumni attendees of the 2023 Kansas Natural Resources Conference.

Learning Through Experience



Left: PSU at Emporia State University celebrating the 50th anniversary of the Kansas Chapter of the Wildlife Society.



Right: PSU Biology students, faculty, and alumni were well represented at the annual meeting of The Wildlife Society in Louisville, KY.



Left: Animal Behavior students practiced conducting behavior observations on the Nature Reach resident animals.

Learning Through Experience



Above: Welcoming the newest and largest cohort of field biology students in Ecology and Field Biology Orientation for the Fall 2023 semester.

Right: Black-tailed prairie dogs, captured on a game camera in Trego County set by MS students Daniel Benson and Jenell de la Peña. Prairie dogs are listed as a Species of Greatest Conservation Need for the state of Kansas.



Left: Luke Headings successfully defended his thesis in Spring 2023. He was co-advised by Drs. George and Brodsky.

Websites/Publicity

Tick Research Publicity

KOAM news: https://www.koamnewsnow.com/video/psu-tick-research-6-23-23/video_6c54246d-c3d1-5977-a62d-1e46e8b2ef8b.html

NPR-KRPS 89.9: <https://www.krps.org/kansas-news/2023-06-29/the-crimson-and-gold-connection-pittsburg-state-biology-dept-contributes-to-kdhe-tick-collection-and-research>

Pitt State Gorilla Connection, The Morning Sun: <https://www.pittstate.edu/gorillaconnection/2023/06/students-helping-to-conduct-tick-research.html>, <https://www.morningsun.net/stories/psu-students-help-conduct-tick-research,72230>



Left: Dr. Ghosh represented Biology Department along with undergraduate students Ashlyn Potter, Marissa Vail, Corey Humble, Madison Reese, and Niamh Dixon at the Health Occupations Students of America (HOSA) - Future Health Professionals Conference held at Pitt State in March this year



Dr. Ghosh and Lab Students at KINBRE January 2023

Oral Presentations

(students underlined; faculty in bold)

- Ghosh A.** 2023. Study of microbial communities from various sources using culture-based and genomics approaches. 21st Annual KINBRE Symposium, Overland Park, KS. (Invited Talk)
- George, A.D., H.B. Price.** 2023. Gray Bats in Southeast Kansas: Research and Monitoring. Kansas Bat Working Group. Emporia, KS.
- George, A.D.,** P.A. Porneluzi, J.M. Haslerig, J. Faaborg. 2023. Bird Community Response to 30 Years of Experimental Management in the Central Hardwoods. The Wildlife Society 31st Annual Conference, Louisville, KY.
- Hansen, B.G., J.E. Whitney, A.M. Bell, S. Ewing, M.G. Fishback, J.A. Holloway, and L.W. Jones. From bad to worse: poor backwater nursery quality declines further during the monsoon season in the San Juan River of NM, CO, and UT, which may impede imperiled fish recruitment. 43rd Annual Researcher's Meeting of the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program, Grand Junction, CO and virtual, January 31, 2023; and Kansas Natural Resources Conference, Manhattan, KS, February 10, 2023.
- Hansen, B.G., J.E. Whitney, A.M. Bell, J.A. Holloway, M.G. Fishback, L.W. Jones, and S. Ewing. 2021-2022 Backwater productivity assessment. Biology Committee Meeting of the San Juan River Basin Recovery Implementation Program, Durango, CO, February 21, 2023.
- Headings, L.A., A.D. George, C.C. Rega-Brodsky. 2023. Evaluating the Avian and Vegetative Communities on Strip Mined Land. 16th Annual Kansas Natural Resources Conference, Manhattan, KS.
- Holloway, J.A., J.E. Whitney, K.L. Boroughs, B.G. Hansen, A.D. King, M.N. Saul, and S.A. Scholes. Ecological morphometrics of Orangethroat (*Etheostoma spectabile*), Plains (*E. pulchellum*), and Plateau Darter (*E. squamosum*) in Kansas. Kansas Natural Resources Conference, Manhattan, KS, February 10, 2023.
- King, A.D., **J.E. Whitney, A. Ghosh,** and J.A. Holloway. Contemporary extent of the Blackspotted Topminnow invasion and frequency of hybridization with native Blackstripe Topminnow in the Spring River sub-basin of Kansas. Kansas Natural Resources Conference, Manhattan, KS, February 10, 2023.
- Loomis, J.N., M. Dent. 2023. Ecological Insights in the Behavior and Diet of Burrowing Owls (*Athene cucularia*) on the Sevilleta National Wildlife Refuge. Kansas Ornithological Society 74th Annual Meeting, Hays, KS.
- Loomis, J.N., A.D. George, C.C. Rega-Brodsky. 2023. Evaluating Effectiveness of AHDriFT System for Surveying Small Mammal and Herpetofauna Communities on Reclaimed Mined Lands. PSU Research Colloquium.
- Monroe, B., H., Price, A. Paynter, A. George, A. Ghosh. 2023. Characterization of Culturable Isolates Obtained from Guano of Gray Bats in Southeast Kansas Following Biochemical and Genomic Approaches. PSU Research Colloquium.
- Michael, T., George, A., Rega-Brodsky, C. C. & Ghosh, A. (Apr 2023) Exploring range boundaries of chorus frogs using morphometric measurements and genetic techniques. PSU Research Colloquium.
- Michael, T., Rega-Brodsky, C. C., & George, A. (Nov 2023) Geographic variation complicates identification of chorus frogs near range boundaries. Kansas Herpetological Society Annual Meeting, Lawrence, KS.
- Rega-Brodsky, C.C.,** Weiss, K. C. B., Green, A. M., Iannarilli, F., Tleimat, J., Fritts, S., Herrera, D., Fisher-Reid, M. C., Compton, J. A., Lafferty, D. J. R., & Allen, M. L. (Feb 2023) Mammalian functional trait responses to anthropogenic and environmental factors across the contiguous USA. KNRC, Manhattan, KS.

- Norman, M., **A.D. George**. Use of Abandoned Mined Lands as Stopover Habitat: Preliminary Findings. Kansas Ornithological Society 74th Annual Meeting, Hays, KS.
- Reese M., Dixon N., and **Ghosh A**. Prevalence and characterization of antibiotic resistant strains of *Enterococcus* spp. and *Acinetobacter* spp. in community household environment. PSU Research Colloquium.
- Rega-Brodsky, C. C.** Searching for the elusive spotted skunk in Kansas. Sperry-Galligar Audubon Society, Pittsburg, KS.
- Whitney, J.E.**, B.G. Hansen, A.M Bell, and M.G. Fishback. Fish behavior, mortality, and diet during a monsoonal spate in the San Juan River, UT, USA. 43rd Annual Researcher's Meeting of the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program, Grand Junction, CO.
- Whitney, J.E.**, A. Braun, B.G. Hansen, J.A Holloway, and A.D. King. Long-term change in Prairie State Park fish communities across a gradient of stream drying. Kansas Natural Resources Conference, Manhattan, KS.

Posters Presented

- Abram, A., Benson, D., de la Peña, J., & **Rega-Brodsky, C.C.** Range expansion for the nine-banded armadillo (*Dasypus novemcinctus*): The potential for leprosy transmission in the United States. K-INBRE Symposium, Overland Park, KS.
- Anzjon, A. & **Rega-Brodsky, C. C.** Urban transportation noise does not influence sea turtle nesting densities along Florida coastlines. PSU Research Colloquium.
- Benson, D., Perkins, J. C., Jefferson, K. P., Dowler, R. C., **Rega-Brodsky, C. C.** & Stevens, R. D. Examination of Plains Spotted Skunk (*Spilogale interrupta*) burrow systems. Annual Meeting of the Southeastern Bat Diversity Network, Jonesboro, AR.
- de la Peña, J., Benson, D., **Rega-Brodsky, C.C.** Intensive camera trap survey for the Plains Spotted Skunk (*Spilogale interrupta*) in Kansas. Annual Meeting of the Southeastern Bat Diversity Network, Jonesboro, AR.
- Benson, D., J. de la Peña, Z. Cordes, **A.D. George**, **C.C. Rega-Brodsky**. Status of the Plains Spotted Skunk (*Spilogale interrupta*) in Kansas: Minimal detections hampering conservation efforts. The Wildlife Society 31st Annual Conference, Louisville, K; PSU Research Colloquium; and KNRC, Manhattan, KS.
- Boyle, W.A., W.E. Jensen, **A.D. George**. Kansas Motus: A New Tool to Study Animal Movements in Kansas. 16th Annual Kansas Natural Resources Conference, Manhattan, KS.
- Evilsizor, D. Analysis of Ozark Chinquapin (*Castanea ozarkensis*) reproduction and Chestnut blight infection at Roaring River State Park, Missouri. Missouri Botanical Symposium, Rolla.
- Hunt, B.G., M.C. Marine, **A.D. George**, Introducing MOFEP: A 100-year Ecological Experiment to Protect Forest Songbirds. PSU Research Colloquium.
- Jantz E., Letterman B., Petro E., and **Ghosh A**. 2023. Tick and tick-borne pathogen surveillance as a public health tool updating Kansas geographic distribution map. Arkansas INBRE Conference, Fayetteville, AR.
- Letterman B., Nippoldt S., Dasgupta A., Carrico L., Belgum H., and **Ghosh A**. Prevalence of ticks and tick-borne pathogens in mined land areas of southeast Kansas. PSU Research Colloquium.

- Loomis, J., Rega-Brodsky, C. C., & George, A. D. Effectiveness of AHDriFT system for surveying herpetofauna communities on reclaimed mined lands. The Wildlife Society Annual Meeting, Louisville, KY.
- Monroe B., Price H., Paynter A., George A., and Ghosh A. Characterization of culturable bacterial isolates obtained from guano of gray bats in Southeast Kansas following biochemical and genomic approaches. KAS Annual Meeting, McPherson, KS. (Best Graduate Poster Award)
- Stringer, K., Benson, D., de la Peña, J., & Rega-Brodsky, C. C. The cat's out of the bag: Comparing the presence of bobcats and domestic cats across habitat types in Kansas. PSU Research Colloquium.
- Stringer, K., Benson, D., de la Peña, J., Whitney, J. & Rega-Brodsky, C. C. The cat's out of the bag: Comparing the habitat preferences of bobcats and domestic cats across southeast Kansas. The Wildlife Society Annual Meeting, Louisville, KY.
- Trout, L. & Rega-Brodsky, C. C. Interspecific competition and the geographic relationship of the red fox (*Vulpes vulpes*), gray fox (*Urocyon cinereoargenteus*), and kit fox (*Vulpes macrotis*). PSU Research Colloquium.
- Trout, R. & Rega-Brodsky, C. C. Red fox (*Vulpes vulpes*) distribution in relation to two prey species: eastern fox squirrel (*Sciurus niger*) and eastern gray squirrel (*Sciurus carolinensis*). PSU Research Colloquium.
- Vail M., Jackson C., and Ghosh A. Comparison of strains of *Staphylococcus aureus* associated with foodborne illnesses following the whole genome sequence analysis approach. K-INBRE Annual Symposium, Overland Park, KS. (iPoster Presentation)



Congratulations to our Spring Class of 2023 Graduates!

Publications

- Benson, D. J., Perkins, J. C., Jefferson, K. P., Dowler, R. C., **Rega-Brodsky, C. C.**, & Stevens, R. D. 2023. Examination of two Plains Spotted Skunk (*Spilogale interrupta*) burrow systems. *Southeastern Naturalist*, 22 (3), 352-363.
- Benson, D., de la Peña, J., **George, A. D.**, & **Rega-Brodsky, C. C.** Submitted. County records and noteworthy detections of gray fox (*Urocyon cinereoargenteus*) in Kansas. *Transactions of the Kansas Academy of Science*.
- Buckardt, E. M., **Rega-Brodsky, C. C.**, & **George, A. D.** 2023. Post-mined wetlands provide breeding habitat for amphibians. *Wetlands* 43, 75.
- Daines, M. 2023. Distribution of *Astragalus amnis-amissi* (Fabaceae), a plant endemic to east-central Idaho. *Western North American Naturalist* 83: 146–151.
- Ghosh, A.** (2023). In Dr. Kellie Wark (Ed.), Cross-colonization between companion animals and owners (11th issue, Feb). *Semmelweis Times* (Newsletter).
- Hahs, A., Fournier, B., Aronson, M. F. J., Nilon, C. H., Herrera-Montes, A., Salisbury, A., Threlfall, C. G., **Rega-Brodsky, C. C.**, ...Kotze, D. J., & Moretti, M. 2023 Urbanisation generates multiple trait syndromes for terrestrial taxa worldwide. *Nature Communications*, 14, 4751.
- Hedden, C.K., S.C. Hedden, K.B. Gido, and **J.E. Whitney**. 2023. Resistance and resilience of Sonora Suckers (*Catostomus insignis*) to extreme wildfire disturbance in the Gila River, New Mexico. *The Southwestern Naturalist* 67: 133-142.
- Maldonado-Ruiz, P., Reif, K., **Ghosh, A.**, Foré, S., Johnson, R., Park, Y. (2023). High levels of alpha-gal with large variation in the salivary glands of lone star ticks fed on human blood. *Scientific Reports*, 13, 21409 (2023).
- Rega-Brodsky, C. C.**, Weiss, K. C. B., Green, A. M., Iannarilli, F., Tleimat, J., Fritts, S., Herrera, D. J., Fisher-Reid, M. C., Compton, J. A., Lafferty, D. J. R., & Allen, M. L. 2023. Mammalian functional trait responses to anthropogenic and environmental factors across the contiguous USA. *Urban Ecosystems*, 26, 309-322.
- Snow, N.**, P.M. Peterson. 2023. A new and evidently rare species of *Dinebra* (Poaceae: Chloridoideae: Eleusininae) from Sonora, Mexico. *Systematic Botany* 48: 371–375.
- Weiss, K. C. B., Green, A. M., Herrera, D. J., Hubbard, T., **Rega-Brodsky, C. C.**, & Allen, M.L. 2023. Effect of species-level trait variation on urban exploitation in mammals. *Ecology*, 104(7), e4055.
- Whitney, J.E.**, Z.R. Garrett, B.G. Hansen, J.A. Holloway, A.D. King, and K. Stark. 2023. The second collection record of Northern Studfish (*Fundulus catenatus*) from Kansas. *Transactions of the Kansas Academy of Science* 126: 51-54.
- Whitney, J.E.**, B.G. Hansen, S.M. Bonjour, A.M. Bell, and M.G. Fishback. In press. Fish behavior, mortality, diet, and movement following a monsoonal spate in the San Juan River, UT, USA.

Masters Theses

Haley Price. *Population Dynamics and Habitat Use by Gray Bats in an Anthropogenically Altered Landscape*. MS Thesis. Advisor: Dr. Andrew George. Defended: March 2023.

Luke Headings. *Bird community response to vegetation structure and exotic plant influence on shrubland birds on mined lands*. MS Thesis. Co-advised by Drs. Andrew George and Christine Brodsky. Defended: April 2023.

Jenell de la Peña. *Characterizing the ecology of Plains (*Spilogale interrupta*) and Eastern (*Spilogale putorius*) spotted skunks: A systematic literature review and population assessment in Kansas*. Advisor: Dr. Christine Brodsky. Defended: November 2023.

Blake Hansen. *Secondary channel backwaters may be superior nurseries for native fishes in the San Juan River of the American Southwest, but monsoon-driven deteriorations may lessen their quality*. Advisor: Dr. James Whitney. Defended: April 2023.

Danielle Evilsizor. *Survey of Ozark chinkapin (*Castanea ozarkensis*) in Roaring River State Park, Barry County, Missouri*. Advisor: Dr. Neil Snow. Defended: October 2023.

Michael Daines. *Vascular Plants of the Caribou-Targhee National Forest and Curlew National Grassland in Southeastern Idaho, Western Wyoming, and northern Utah*. Advisor: Dr. Neil Snow. Defended: April 2023.

Bobbi Monroe. *Using a culturable approach and metagenomic analysis to uncover gut bacterial diversity of gray bats in Kansas*. Advisor: A. Ghosh. Defended: August 2023.

Grants

Ghosh A. Study of microbial communities from various sources using culture-based and genomics approaches. 21st Annual KINBRE Symposium, Overland Park, KS. (Invited Talk)

Hansen, B.G. Otto Tiemeier-Frank Cross Student Scholarship Award from the Kansas Chapter of the American Fisheries Society (\$300).

Snow, N. Studies of Myrtaceae in New Caledonia. Muséum national d'Histoire naturelle, Paris, 5 weeks. €3000. Source: Franklinia Foundation.

George, A. Using automated radio-telemetry to study habitat use and activity patterns of gray bats in southeast Kansas. Kansas Department of Wildlife & Parks.



Aaron Higginbotham, Max Sheffer, Preston Sweaney, Braden Shelton, Isabella Friemel, and Ali Vanzant participated in a Q & A panel in pre-health orientation. They discussed DAT/MCAT prep courses, letters of recommendations, interview processes, medical & volunteer experiences, and the overall application process. Thank you for providing an insightful experience to our sophomore and junior students!



Jessi Snow, Alaina Fulkerson and Tabitha Caruthers sorting specimens during Spring Break at the Missouri Botanical Garden with staff.



The PSU-ESU joint field trip to South Padre Island, TX to volunteer with Sea Turtle Inc. Top panel from left to right: Judy Scherff, James Whitney, Miranda Hallacy, Annika Anzjon, Jossie Shumaker, Maggie Saul, Kit Garvin, and Talya Crouch. Bottom left: Dr. Rachel Bowes (ESU) and Miranda Hallacy work to repair the sea turtle nesting corral.



Herpetology class photo, Queen Wilhelmina Lodge, Arkansas

Right: Student Erik Jantz attending a workshop at Ar-INBRE



Below: “Flint” the American Flamingo, a rarity, observed in Chase County. Dr. George and two students were able to see flint on their way to the Kansas Ornithological Society Meeting in Hays.



Right: Khloey Stringer with a Brown Thrasher at the Monohan property



Left: PSU Students Sampling Gray Bats with our friends from Missouri State University. Dr. George and colleagues are using the Motus network to study bat migration



CONTACT US!

The PSU Biology Department welcomes questions.
Please contact our staff using the below information.

Biology Admin/General Contact: Libby Graham, 620-235-4732, biol@pittstate.edu or ljgraham@pittstate.edu

Chair: Dr. Bobby Winters, 620-235-4748, bwinters@pittstate.edu

Field Education/Biology Teacher Education: Dr. Christine Brodsky, 620-235-4947, cbrodsky@pittstate.edu

Medical Laboratory Sciences, Pre-Health Education: Dr. Peter Chung, 620-235-4736, pchung@pittstate.edu

Wildlife Conservation/Field Education: Dr. Andrew George, 620-235-4030, adgeorge@pittstate.edu

Pre-Health Education: Dr. Anuradha Ghosh, 620-235-4532, aghosh@pittstate.edu

Pre-Health Education/Cellular and Molecular Biology: Dr. Phillip Harries, 620-235-4864, pharries@pittstate.edu

Field/General Biology Education: Dr. Hermann Nonnenmacher, 620-235-4834, hnonnenmacher@pittstate.edu

Pre-Health Education/Genetics: Dr. Mandy Peak Bryan, 620-235-6541, mpeak@pittstate.edu

Anatomy & Physiology/Human Dissection Education: Dr. Neal Schmidt, 620-234-4737, nschmidt@pittstate.edu

Botany/Field Education: Dr. Neil Snow, nsnow@pittstate.edu

General Biology/Human Physiology Education: Dr. Christopher Ward, 620-235-4741, Christopher.ward@pittstate.edu

Field/Fisheries/Aquatic Education: Dr. James Whitney, 620-235-4735, jewhitney@pittstate.edu

Pre-Health Education/Cellular and Molecular Biology: Dr. Daniel Zurek, 620-235-4746, dzurek@pittstate.edu

Nature Reach: Ms. Delia Lister, 620-235-4805, dlister@pittstate.edu

Thank You!