



BioNews 2020

Department of Biology
Pittsburg State University



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Drs. Brandon Schartz and Virginia Rider during recent visit at PSU.

From the Chair's Desk

As the year of 2020 ends, I send all friends of the Biology Department hearty greetings. It is my distinct pleasure to introduce Latisha Potter "Tish" as the Administrative Specialist for the Biology Department. Tish previously worked in the College of Technology. She joined the Biology Department over the summer and settled in immediately. Tish brings a wealth of knowledge and a delightful attitude to the office. I know that I speak for



Dr. Virginia Rider

the entire Department when I say how lucky we are that Tish chose Biology to be her home. Kim Grissom continues to manage the day-to-day operations of the prep lab. She provides invaluable help to all of the biology laboratories, keeping the stockroom supplied and placing orders. She is the "fix it, find it, dispose it" person for the Department and ensures smooth operation on a daily basis. Both of these fine professionals provide a supportive, friendly environment for our students. I cannot praise them strongly enough (see images, page 3).

This certainly has been a challenging year for all with the pandemic. Classes were taught remotely beginning in March and then over the summer. Through the enormous effort of administration, faculty and staff, we came roaring back for the fall semester. It was indeed challenging to mask, socially distance, and retool all classes to accommodate covid restrictions. Now that we are at the end of the semester, there is immense relief for mission accomplished. The faculty learned a lot and the students were grateful for face-to-face class time.

The faculty continue to attract extramural funding and national recognition for ongoing research in the Department. I had the privilege to attend three graduate student defenses this fall Jaiwei Xu, Kali Boroughs and Amy Hammesfahr. In spite of covid restrictions, these students acquired substantial data. Their defenses were exceptional. All three projects involved research

relevant to their disciplines or to us living in this region. If you are interested in learning more about student projects and research in Biology, please browse the Department webpage and see pp. 15-17 below.

Mike Robinson, a Biology Department alum, recently visited campus, the Herbarium and the Monahan property. Mike retired from a distinguished career in Health, Safety and Environmental Management. He will be helping students explore many options to develop careers in these areas. Brandon Schartz (photo, page 1) stopped in for a chat and it took us hours to catch up. Brandon is an anesthesiologist living with his family in Virginia. Brandon will be talking with the pre students about the many opportunities in medicine. We are always glad to see former students and share in their amazing accomplishments.

The Nature Reach program, headed up by Delia Lister, received a \$10,000 grant from Evergy to help fund the Raptor Ambassadors Improved Housing project built by the Westar Green Team in 2007 and 2011. Delia (below) says the raptors are the most popular ambassadors she takes to schools as part of the outreach arm of Nature Reach education (see photo). In these fiscally lean times, external funding has become increasingly important. We are grateful for Evergy's support of outreach education.



Delia Lister with a Harris's Hawk.

For those who have not heard, a new dental school in Joplin is projected to open in 2022. The state of the art facility will be built on the Kansas City University (KCU) campus in Joplin. Graduates of Pittsburg State University who are pursuing a career in dentistry will be able to complete their degrees in fewer years and do so closer to home, thanks to a "Partners Program"

we have with KCU. Since Kansas does not have a dental school, the new dental school will provide significant opportunities for our students. If you would like to find out more about the Partner's Program, please contact Phil Harries, who is the lead predental advisor for the Department.

I stepped down after serving for seventeen years as the campus coordinator for the Kansas Idea Network of Biomedical Research Excellence (K-INBRE). Christine Brodsky has taken up the leadership reins. Christine has a passion for undergraduate research and I am confident that she will grow additional research opportunities for undergraduate students in Biology, Chemistry and across campus. The K-INBRE is in its second year of a five-year award and provides scholar support for a large number of undergraduate students.

Although I no longer track premedical students for the Department, two of my advisees, Ryan and Simon Higginbotham were accepted at KUMC early decision. How nice they will have each other for support. Sarah Wilkinson, who assists me in the Human Physiology lab, was accepted to OSU Medical School with in-state tuition. Sarah is still interviewing but she knows she is going to medical school. We have many qualified students who are in the interview process, and it looks to be a banner year for acceptance. The pre-physician assistant (pre-PA) program continues to grow. Freshmen are beginning to declare pre-PA at first enrollment indicating increasing awareness about this emphasis area offered in Biology.

The Biology faculty worked exceptionally hard this past year to educate our students. I will let each faculty member write about the many successes enjoyed in spite of covid constraints. In closing, I think of the Bob Dylan song, "The Times They are a Changing." This certainly has been a different year. I am in awe of science in this country. The production of a covid vaccine has been a marvel. I get excited thinking about the discoveries our students have in front of them. It is difficult to predict what we will look like in ten years but my hope is that we will be better, stronger and keep the best parts of changing times. I send you good cheer for a peaceful and healthy New Year.



Left: Kim Grissom in the Prep Room on the third floor of Heckert-Wells Hall. Kim's eagle eye and organizational prowess oversee many aspects of the labs and supplies operations of the Biology Department.

Below: Tish Potter with her too-cute canine buddy, Sansa. Tish and her happy smile provide the administrative glue that holds the Department together and keep it functioning smoothly.

Interestingly, both KimS and Tish served in the US Army, with stints in Germany. Thanks to you both!





Dr. Christine Brodsky

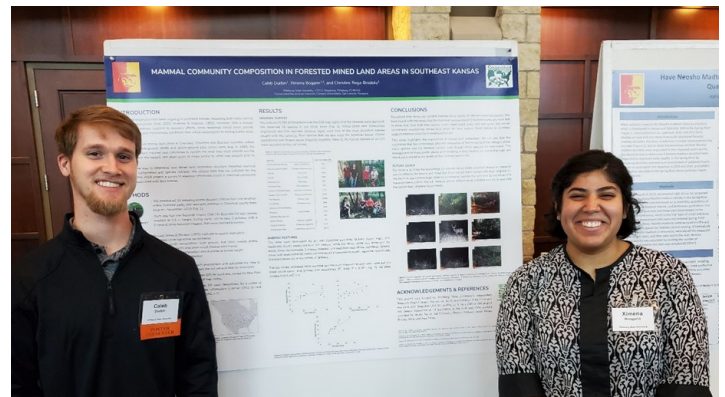
2020 was quite a unique year for teaching and research! Even though we had to make some quick changes, we were able to make the best out of the year. We are lucky to have such resilient

students in the Biology Department. With the switch to online learning mid-Spring, students were quick to make the change and rolled with the year's metaphorical punches. Students in Environmental Life Science shifted easily to online labs, while the Human Dimensions of Natural Resource Management students had to completely redesign their survey methodology for their Southeast Kansas Nature Center park visitor survey. Students were able to move their survey online and collected informative data for the Nature Center. Luckily for the Fall, we began to meet safely for labs on campus, allowing our Mammalogy students to work with our museum specimens.

With the help of Zoom, research collaborations did not slow down in 2020, in fact, they seemed to have broadened and increased. My coauthors and I were able to get four new papers accepted to top ecological journals (e.g. *Nature Ecology & Evolution*, *BioScience*, and *Ecology*) and we recently submitted a book chapter on urban bird communities for the new Routledge *Handbook for Urban Biodiversity*. One particularly exciting publication to be accepted is from our Snapshot 2019 camera trap study, with Caleb Durbin (Biology undergraduate) as a coauthor!

Once again, our student researchers have done some phenomenal work – Caleb Durbin, Ximena Bogarín, Maggie Murray, and Morgan Smith, to name a few! Caleb spearheaded a spotted skunk

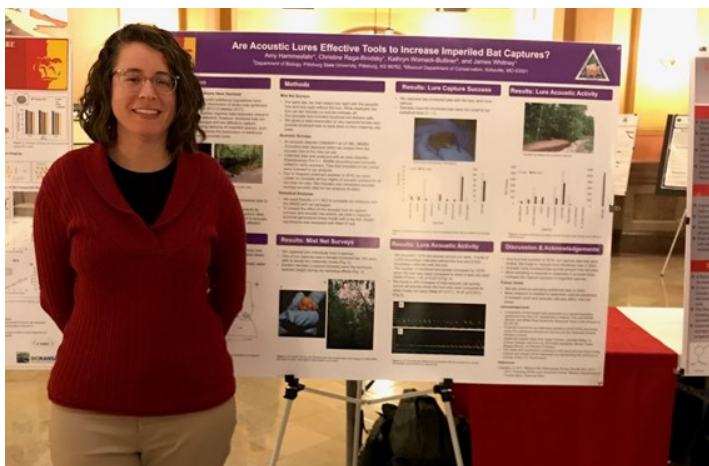
camera trap survey for Crawford and Cherokee counties, while still serving as the lead student researcher for the Snapshot USA data collection. Caleb and Ximena, an exchange student from Paraguay, won two poster awards for their work analyzing Snapshot USA data we collected in 2019. Students from Human Dimensions also did a fantastic job designing a poster for their survey results on the SE KS Nature Center visitors. Even though Ashlyn Henderson, Erin Kruse, Ashlynn Sinclair, and Peyton Witham had to upload their poster for the digital 2020 Research Colloquium, they were able to do a formal presentation to the Center Director, along with the rest of the class who presented their findings via a PowerPoint presentation and written report.



Caleb Durbin and Ximena Bogarín with their poster at the Kansas Natural Resources Conference, which won Best Student Wildlife Poster Award at KNRC and Best Undergraduate Poster Award at the Undergraduate Capitol Research Summit in Topeka.

This Fall semester, Amy Hammesfahr successfully defended her Master's thesis entitled *Solutions for imperiled bat conservation: integrating ecology, technology, and the public*. Kudos to Amy for wrapping up her research during one of the more challenging semesters, and knocking it out of the park! Dr. George and I have also welcomed two new graduate students to study southeast Kansas mined land ecology: Luke Headings and Emma Buckardt. We are excited to have them both on campus!

Starting in August, I was lucky enough to begin to serve as the new Kansas Idea Network of Biomedical Research Excellence (K-INBRE) Campus Coordinator for Pittsburg State, filling the role long-held by Dr. Rider.



Amy Hammesfahr presenting her Master's research at the Graduate Capitol Research Summit in Topeka.

Dr. Rider has been a fantastic mentor as I begin to step into this new position, and we all truly appreciate her dedication to student research and K-INBRE over the years. In 2020/2021, we have eight scholars and 17 faculty mentors, newly welcoming Dr. Laurent Prétôt from Psychology. It has been so wonderful to work with our K-INBRE scholars and mentors so far this semester, and I'm excited to see their iPosters this upcoming K-INBRE Annual Meeting in January! Here's to a happy and especially healthy 2021!

Dr. Mandy Peak Bryan



Hello Gorillas! After a semester of zoom, recorded lectures, and COVID room capacity, I am pleased to report we had a successful year for students applying to professional schools. Dylan Waugh and Lindsey Stander were accepted into UMKC School of Dentistry, Drew Phillips was accepted into Creighton School of Dentistry, and Glenn Sigler was accepted into AT Still School of Dentistry. Samantha Knoblauch was accepted into University of Missouri-St. Louis optometry school. Michael Titsworth was accepted into Colorado State Master of Science in Assisted Reproductive Technology and Andrew Andoyo was accepted to UMKC Mas-

ter of Science in Anesthesia. Students started their first year of medical school in 2020 include Tyson Roderique (AT Still), Kevin Smith (NYIT-COM), Sarah Veasart (KU), and Quinnlyn Walcott (KU). In addition, Ryan Asauskas, Simon Higginbotham, and Ryan Higginbotham were accepted to the Early Decision Program at KU Med and Tyler Gossett was accepted into the Reserved Admissions Program at UMKC School of Dentistry. And finally, the students that were accepted into physical therapy schools include Samantha Bollinger (Missouri State), Abby Denton (Missouri State), and Adam Martinie (St. Marys).

Several of our Pitt State Biology alumni graduated from medical school this year, including: Kelsie Goins (Internal Medicine; Univ. Kansas); Maria Newmaster (Pediatrics; Childrens Mercy Hospital, KC); Trista Dugan Vancuren (Pediatrics; Univ. Oklahoma); Peter Meier (Family Medicine; Univ. Kansas-Wichita); David Schlee (Obstetrics and Gynecology; MedStar, Washington DC); Tyler Elmore (Internal Medicine; Creighton University); Jace Erwin (Orthopedic Surgery; Univ. of Cincinnati); Boya Abudu (Dermatology; Univ. California-Davis); and Briggs Westby (General Surgery; Univ. South Carolina). Congrats!!!

Leslie Hanna, Haley Northcutt, and Kylie Gafford (also awarded Top Student of her class!) graduated from Wichita State Physician Assistant Program, and Ginger Pond graduated from UT Health San Antonio Physician Assistant Program. Congrats!!



Grad student Mary Whiteacre, shown here holding a Wilson's Warbler.



Dr. Peter Chung

Greetings and Happy Holidays from the Biology Department. What a year 2020 has been.

Classes have kept us busy, more so with the pandemic this year. Fortunately, some of us were able to adjust to having face to face classes with a reduced number of

students, and we were able to get through this year in one piece. Thanks to Kim, Tish and student staff for keeping the prep lab running smooth this year, especially during the summer.

Summer Pitt Cares enrollment was interesting as most of it was done online and via phone. We had a great group of incoming freshmen and they much appreciated having the one on one quality reach-out from faculty enrolling them and welcoming them into our department. We look forward to seeing them succeed in their years at Pitt. Thanks to Phil, Christine, Andy, Anu and Virginia for helping out with a modified format this summer.



PSU Physical Therapy Success Organization visit to Wichita State School of Physical Therapy, February 2020.

We still get much interest in our programs from students throughout the state as well as surrounding states; some of us have continued to meet with prospective students face-to-face while others have found other ways to communicate with these interested students. We hope the trend of increasing enrollment in our department continues and that we are able to provide them with a truly transformation-

al experience.

On the research side, our lab has accepted a couple of undergraduate students to begin work in the lab. Our graduate student total is now up to 3, with 2 of them working on a professional Master's and one with a research option who will begin this coming spring.

Remote meetings seem to be the new norm now. Between TAAC meetings of the Kansas Board of Regents, to commencement and college curriculum meetings, Zoom and Microsoft Teams have become my new acquaintances.

Many events planned this year have been canceled due to the pandemic, i.e. our annual PT Open House, our annual Science Day, visits to professional schools, etc. We look forward to re-establishing them once things get better and open back up.

There is always more to be said, but I leave you with my usual farewell, modified in the time of a pandemic: To all our graduates, colleagues and friends, do not be strangers; stay in contact, keep in touch, and do visit with us virtually via Zoom/Microsoft Teams/Duo/Facetime when you get a chance. Be well and stay safe.

Regards,

Dr. Peter Chung (pchung@pittstate.edu)

Dr. Andrew George

Hello, Everyone. To state the obvious, this has been a year unlike any other.

Among other challenges, we have been forced to find creative ways to teach field-based courses in a remote learning format. Notably, our famous spring ornithology field trip to the Platte River, Nebraska, was cancelled two weeks before the trip was scheduled. While missing out on this trip was certainly a disappointment for our students, we have been able to continue the local field trips that are essential to courses such as Terrestrial Field Ecology. Nine of our



students were also able to participate in the Kansas Herpetological Society (KHS) fall field trip in September. We helped document 32 reptile and amphibian species (241 individuals) in Bourbon County, all while staying physically-distanced.



Grad student Luke Headings with a white-eyed vireo (*Vireo griseus*) at the Natural History Reserve.

Perhaps the most exciting news from 2020 is that work began on two multi-year research projects, both of which are supported by grants from the Kansas Dept. Wildlife, Parks & Tourism (KDWPT). The first project is focused on population demographics and habitat use of Kansas' only colony of gray bats. In the second project, Christine Brodsky and I are assessing the conservation value of mined lands. We recruited three outstanding graduate students to manage the projects: Haley Price, Luke Headings, and Emma Buckardt, from Tennessee, Ohio, and Illinois, respectively. Each student brings a wealth of experience to the projects, and we are thrilled that they have joined our program.

Our collaboration with the Missouri Ozark Forest Ecosystem Project (MOFEP) has also continued. Now in its 29th year, MOFEP has become an exemplary model for applied forestry research. In 2020 we began the next phase of the project, which will continue through 2022. New PSU grad student Mary Whiteacre joined the project in August. Her thesis

will focus on landscape-scale effects of forest management on Ozark bird communities.



Grad student Haley Price sets up an insect light trap to measure food availability for bats.

In other MOFEP news, part of David Hollie's 2019 Master's thesis was recently published in *Ecosphere*. [<https://esajournals.onlinelibrary.wiley.com/doi/10.1002/ecs2.3294>]. Congrats to David for this major accomplishment!



Grad student Emma Buckardt at one of her study sites on the Mined Land Wildlife Areas.



Dr. Anu Ghosh

Sincere Greetings!

This year reminds us how unpredictable the future is; what we do today, that matters the most. We started the year with the loss of our most valuable member of Biology family. Kelly, you will always be in our hearts.

Any achievements on behalf of students or faculties mean a lot this year. I would like to mention some of my graduate students' finished work that were published this year. I am also thankful to publish some of my unfinished works from my previous job (please see under Professional Activities below, pp. 15-17).

Rachel Bechtold (pursuing Ph.D. at University of Arkansas-Fayetteville): Rachel's research project was based on the Monahan Outdoor Education Center. This is the first study looking at the bacterial community of abandoned mine land in this area. This study sheds light on possibilities to restore acid mine drainage sites using native bacterial community (Bechtold et al. 2020). Elena Olson (currently pursuing Ph.D. at the University of Wisconsin-Madison): Elena's study was focused on food microbiology and was in collaboration with Food Science Department of Univ. of Arkansas-Fayetteville). We sequenced the genomes of several bacterial isolates from animal feeds. This project advanced knowledge on genomics-based pre-harvest food safety (Olson et al. 2020).

Every bacterial taxonomist has a dream of discovering a new genus of bacteria. I was no exception. I had a few publications on finding novel species but not a genus. It was seven-year wait, and finally we published it in the most reputed journal of microbial taxonomy. This project started in 2013 when I was a postdoc and this year it was completed by another postdoc. The wait was worth it, and I could not ask for more. We identified the new bacteria as a new genus but also up to new Family, new Order and new Class of *Firmicutes* (Neupane, Ghosh et al. 2020).

It is worthwhile to mention that our Biology pre-veterinary emphasis area has flourished over past few years. This is very encouraging. We are looking up to animal lovers who are willing to fund some scholarships for our pre-vet students. Also, on behalf of our departmental scholarship committee, I would like to reach out to all our alumni and well-wishers for your support to create scholarships for outstanding incoming freshmen. During this strange and difficult time, any support for recruitment is invaluable. Please feel free to contact me (aghosh@pittstate.edu) or our department Chair (vruider@pittstate.edu) if you need any information.

Happy retirement to my mentor and a pillar of the Biology Department, Dr. Joe Arruda! I am grateful to know him as a person and as a colleague. Our best wishes are always with you and Suzanne.

Hoping to have a healthier and happier 2021 since with the advent of vaccines the pandemic will be under control. However, if we still do not learn the lesson and do not take care of our environment and value the wildlife and wilderness, this pandemic is not going to be the last one, there will be many more in coming decades. Thank you all. — Anu



Grad student Adara Wolfe collecting soil for lead (Pb) test.



Dr. Phillip Harries

Greetings from Heckert-Wells. It's definitely been an unusual and 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. The transition into hybrid

(mix of online and in-person) course formats in order to provide flexibility during the pandemic was demanding but seems to have worked out surprisingly well.

A high point this year is that I was fortunate to be involved with helping to broker a new partners agreement between PSU and Kansas City University's medical school and upcoming dental school that will open in Joplin. The agreement will allow eligible



Dr. Harries working with Max Medley, a pre-dentistry student.

PSU students to apply to medical or dental school in the middle of their sophomore year. If accepted they would skip their senior year of undergraduate work allowing them to receive their bachelors degree in 7 years instead of the traditional 8 years. The agreement, and in particular the pending arrival of the new dental school, spurred quite a bit of interest and some local media coverage.

In the lab, my graduate student of the last two years, Abbi Morgan, has moved on to pursue a PhD in Neuroscience at the OU Health Science Center. She is definitely missed in the department where she was a stellar TA and student. It sounds like she is thriving in her new lab and enjoying her research and we wish her the very best. My current graduate student, Devapriya Segaran, who joined us last year from India, is examining the ability of several plant compounds to kill cancer cells and mitigate their metastatic potential. Unfortunately, Devapriya's research was put on hold for much of the year due to Covid, but in August she threw herself back into her work obtained a large amount of quality data in a short period of time. I am impressed with her motivation and am excited to see the final results of her work!

Dr. Anu Ghosh and I are continuing in our role as the department's graduate coordinators, which primarily involves facilitating the screening of applications. If you know of anyone considering a graduate degree in biology, then please encourage them to get in touch with Dr. Ghosh or myself.

On a personal note, my oldest son is currently a sophomore studying computer engineering at K-State. His younger brother is a senior in High school who has been very involved in music both in and out of school. He has even gotten me to dust off the old guitar and start playing again, which has been a lot of fun. I've still been running a lot the last year and am hoping that it may be possible to participate in some races in 2021. I hope everyone is doing well and best wishes to all for a healthy and happy 2021!



Terrestrial Field Ecology students measure vegetation structure at Prairie State Park.



Delia Lister

What can I say...2020 has been strange to say the least! Teaching online since March has been a challenge, but we are all making it through. The shift to teaching online certainly forced me to challenge myself, but some really great

stuff has happened because of it. I have completely redesigned how I teach Care and Management of Captive Animals and how students will work their way through getting the most of their experience as animal keepers. The time I would have normally spent going to classrooms has been



Max Bare gives his presentation in Fall Semester with Live Animal Presentation Practice.

filled with completing projects that needed attention and updating animal care protocols. I want to especially thank my Summer Intern, Gizelle Sisson, for all her hard work. For weeks over the Spring and Summer she and I were the only two able to do animal care...and it's a big job. All of my student keepers, though, have really stepped up to the plate this last year and watching their growth has been a highlight of past few months.

I am very much looking forward to teaching Natural History Interpretation this coming Spring. Students really gain so much from becoming a Certified Inter-

pretive Guide though the National Association for Interpretation. One of my former students recently landed a much-coveted position with the Sedgwick County Zoo in Wichita, KS!

The highlight of this last summer was our Summer Camp. While things did not go as planned, we were still able to pull off an at home camp experience with kits and teaching by Zoom. I have had many reports from parents that say their kiddos are still using the supplies they received in their kits to explore their backyards.

Starting January 2021, I will be President-elect of the Kansas Association for Conservation and Environmental Education (KACEE). I could not be prouder of the work this organization is doing to improve environmental education in Kansas and beyond.

As usual, 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 36 years without the generosity of donors!



Dr. Heather Wallace of Broadway Animal Hospital led a raptor necropsy with students in my Care and Management of Captive Animal class. Gizelle Sisson is the student in the red sweatshirt.



Dr. Hermann Nonnenmacher

Students' return to the classroom and labs in the fall semester has been successful in many ways. Students in my classes had the highest attendance that I can recall, and the few absences noted were due to quarantine status, but the students kept up with their

studies by distance approaches and were happy to get back to their work areas in class when cleared to do so.

I worked with all students on the first day of the fall semester by meeting with them outside where they could socially-distance, and we practiced proper handwashing protocol, and reviewed types of effective masks and proper wearing of masks upon entering any campus buildings. All work spaces were marked clearly and each room had disinfectant that students were very responsible in applying before they left their areas. There were no CoVid-19 mitigation protocol difficulties with any of my students during the semester.

Field research on presence of native wild silk moth species in urban and rural areas was begun in winter, 2019. The study is partly a survey of silk cocoon presence and diversity, as well as causes of mortality during pupation. Another component of the study relates to successful emergence of viable adults, mating success, and mortality of larvae. These components were conducted in spring, summer, and fall, 2020. Species currently in the study are *Hyalophora cecropia* (cecropia moth), *Antheraea polyphemus* (Polyphemus moth), *Actius luna* (luna moth), and *Callosamia promethea* (promethea moth).

I participated, in fall semester, 2020, in the Kansas Core Outcomes Group as a PSU biology department representative, tasked with reviewing our two semesters majors biology courses, Principles of Biology I and II, with the goal of maintaining transfer equivalency of this sequence among the participating col-

leges and universities in Kansas. No changes were made to the current Core Outcomes among the participating institutions.

I am looking forward to the spring, 2021 semester of face-to-face classes, and to everyone living in good health, as we become better adapted to best practices that help us to keep our campus open and provide education and experiences that are valuable for our students.

Dr. Neil Snow

When all goes crazy in the world, grab a rod and hit the Blackfoot River....

The planned Spring sabbatical for research on Myrtaceae in Paris (mostly) and Geneva was put on hold in early March, right before the world went into lockdown. That time was re-directed towards intensifying curation of vascular plants in the Sperry Herbarium, working at the house mounting plants, and (for the first time) some bryophytes. My MS student Jiawei Xu likewise worked at her house databasing during this time.

The summer months involved continued curatorial work remotely in Montana, mostly georeferencing and correcting errors in the data base. I also volunteered about 80 hours for the City of Helena and its South Hills trail system reducing or eliminating populations of musk thistle. Nothing beats honest physical labor in the mountains, and our Labrador tagged along for never-ending rounds of fetch with big pine sticks. (There is no "off" switch on a Lab.)

Back at PSU in August we resumed and intensified the databasing and mounting of plant specimens with support from NSF. For the calendar year we mounted 2300 specimens and databased 10,700. Many thanks to Jiawei Xu, Madeline Gay, Ximena Bogarín, Andrew Ortolani, Daniel Munguia, Kayano Vail, and Dr. Dixie Smith for their assistance.



Apart from backlogged material, all vascular plant specimens have been moved to Hartman Hall, but the books, bryophytes, equipment and the backlogged specimens remain to be moved. We will be vacated from Heckert-Wells 302, where the herbarium has been since the completion of the Heckert-Wells, and fully moved into Hartman by the end of Spring semester.

A big research accomplishment was publication, after a 22-year gestation, of a taxonomic revision of the plant genus *Gossia* from New Caledonia, which included many new species and subspecies. See below for other research output, including Hammesfahr et al. 2020 (p. 15), by former Plant Taxonomy students.



***Gossia clusioides* subsp. *callmanderiana*, a new subspecies honoring my Swiss colleague Dr. Martin Callmander of the Geneva Botanical Gardens.**

I co-authored a proposal to the National Science Foundation in the Fall, spearheaded by colleagues at the University of Arkansas-Fayetteville. It includes many other institutions with goals to database specimens from the Interior Highlands Region, encompassing mostly southern Missouri and northern Arkansas, but also parts of eastern Oklahoma and a small part of Cherokee County, Kansas.

And now, the best part of being a faculty member: Offering kudos to current and former students. First, Sam Pryer continues in her second year as a doctoral student at the University of Florida. Secondly, Natalia Agostini Schneider has been admitted to the doctoral program at St Louis University. Finally, congratulations to Jiawei Xu on the defense of her thesis "A Survey of Leaf Venation in New Caledonian *Syzygium*

(Myrtaceae)." Her skills at data basing have been immensely helpful in achieving one of the top priorities of the NSF grant, and thanks largely to her the vascular plants are mostly databased.

Finally: Let us be grateful, despite its horrible toll, that this cursed virus arrived in 2020, and not in 2000. The miracle of having produced vaccines so quickly would have been impossible then. The research leading to the vaccines represents a stunning achievement for Biology and is a glowing testimony to the power of cooperative, international science.

Dr. James Whitney

Despite the pandemic, 2020 was a busy year for doing research and field work. During the summer of 2020 we completed the second year of sampling for a project that sought to determine if improving water quality in the Spring River of southeastern Kansas is promoting greater prevalence of the Neosho



Madtom, a small (max size = 3 inches) catfish species that is federally-threatened. Back in the 1990s water quality in the lower Spring River was impaired by metal pollution originating from the Tri-State Mining District, but since then cadmium, lead, and zinc concentrations have greatly decreased.

This project is funded by the US Fish and Wildlife Service and the Kansas Department of Wildlife, Parks and Tourism, and is the primary focus of Kali Boroughs' Master's thesis. For this project myself, Kali, and the two research technicians supported by the project (PSU undergrads Aliyah Clemens and Austin Thompson) traveled to 42 sites in the Neosho and Spring River basins to assess fish and macroinvertebrate communities, in addition to quantifying habitat characteristics. Sites in the Neosho River basin ranged from west of Emporia in Chase County down to the Oklahoma border (Chetopa), and in the Spring River basin spanned from the Missouri border down to Oklahoma (Baxter Springs). In 2020 we captured 478 Neosho Madtoms, which was far more than the 129 individuals we captured in 2019.

Furthermore, Kali worked on analyzing and writing up the results from this project for her thesis during the fall, which she successfully defended on November 10th. We found that Neosho Madtom populations have responded positively to improving water quality in the lower Spring River, as abundances in this reach are now similar to those in the upper Spring River above metal pollution inputs, and to those in the Neosho and Cottonwood Rivers where there isn't mining-derived metal pollution. This was a very encouraging result for native fish conservation.



This Fall we welcomed back recent PSU alum Alexandra King (at left). She has already given presentations and co-authored publications (see Professional Activities).

We had several excited fish finds during 2020 as part of the Neosho Madtom project and some other projects. For instance, on June 12th we found three Hornyhead Chubs in the Little Osage River in Bourbon County, which was only the third time that species has ever been found in that river in Kansas, and the first time since 2007.

Furthermore, we caught a 27-inch Blue Sucker from the Neosho River near Erie on July 1st, which was only the second time in my life that I have encountered that species. Additionally, we found Banded Sculpin in the Spring River below Empire Lake on June 26th and July 24th, and in the Spring River at Baxter Springs on October 1st. These collections represent the first time that Banded Sculpin have been found in the Spring River mainstem in Kansas since 1993. We also found Freckled Madtom in the Spring River of Kansas for the first time ever, with the only other collection of this species from the Spring River occurring in Missouri back in the 1940s. Finally, we captured River Darter from several locations in the Neosho and Spring Rivers of Kansas, which is a species I had never captured prior to 2020.

This year was supposed to be for doing research than it actually was, as we were set to have a project begin on the San Juan River in the Four-Corners region investigating factors affecting the reproductive success of Colorado Pikeminnow and Razorback Sucker, which are both federally-endangered species. However, this project was postponed due to the pandemic, but is now slated to start during the summer of 2021. Blake Hansen will work as a graduate research assistant on this project beginning in January 2021. This project is funded by the U.S. Fish and Wildlife Service.

Prior to the pandemic, 2020 involved presenting research projects at regional and international conferences. For instance, in January my co-authors and I presented at the Kansas Natural Resources Conference (KNRC) in Manhattan, KS. These presentations included a poster over the current status of Kansas' Ozarkian fish fauna by Alexandra King, who also began as a graduate student at Pittsburg State in the Fall of 2020. Other presentations given at KNRC included a poster over the Neosho Madtom project by Kali Boroughs, and an oral presentation that I gave concerning environmental factors that explain the distribution of Blackside Darter in Kansas.



The Neosho Madtom (*Noturus placidus*). This species is listed as threatened under the Endangered Species Act (1973), and is a major focus of Kali Boroughs' Master's thesis project.

Kali won an award for best student poster and I won best professional presentation, both of which were given by the Kansas Chapter of the American Fisheries Society (KS AFS). Josh Holloway also attended KNRC, and won the Klassen Award from KS AFS that covered his costs of attending that meeting. Madtom poster.

Lastly, Kali and I attended the International Catfish Symposium in Little Rock, AR (February 18-20). Kali won a travel award from the KS AFS that covered her expenses to attend this meeting, where she presented her poster on the Neosho Madtom.



In terms of teaching in 2020, I taught Biometry, Ichthyology, and Principles of Ecology during the spring semester, and Fisheries Management, Principles of Ecology, and Environmental Life Sciences during the fall semester. Teaching during 2020 required learning quite a few new techniques for online instruction, as all of my spring classes had to be moved to an online format in March, and all of my fall classes were either online or hybrid.

However, for Fisheries Management during the fall we were able to take several field trips to local waterbodies to sample fishes, which was very refreshing after having to do so much online teaching. During the spring 2021 semester I will be teaching Biometry, Marine Biology, and Principles of Ecology.

In conclusion, despite the pandemic, 2020 was still a productive year! But, here's hoping that 2021 will be a bit more normal.



Top left: Kali Burroughs holding a shortnose gar. Above left (L to R): Brooks Neria, Kit Garvin, and Alex King identifying and measuring fish from Second Cow Creek in Crawford County as part of a Fisheries Management field trip on August 20, 2020. Above right: Grad student Delapriya Segaran.

PROFESSIONAL ACTIVITY (PSU faculty in bold; student authors underlined).

Publications

Bechtold R., Sharma N.K., Vega M., Datta S., **Arruda J.**, **Ghosh A.** 2020. Isolation and characterization of soil bacteria from an abandoned coal mine in southeast Kansas. *Transactions of the Kansas Academy of Science* 123:371-385.

Hammesfahr, A., P. Whitman, C. Campbell, **N. Snow.** 2020. Another confirmation of *Cyperus flavescens* (Cyperaceae) for Kansas, U.S.A. *Journal of the Botanical Research Institute of Texas* 14: 411–412.

Hollie, D.R., **A.D. George**, P.A. Porneluzi, J.M. Haslerig, and J. Faaborg. 2020. Avian community response to experimental forest management. *Ecosphere* 11:11 <https://doi.org/10.1002/ecs2.3294>

Knapp, S., Aronson, M.F.J., Carpenter, E., Herrera-Montes, A., Jung, K., Kotze, D.J., La Sorte, F.A., Lepczyk, C.A., MacGregor-Fors, I., MacIvor, J.S., Moretti, M., Nilon, C.H., Piana, M.R., **Rega-Brodsky, C.C.**, Salisbury, A., Threlfall, C.G., Trisos, C., Williams, N.S.G., & Hahs, A.K. 2020. A research agenda for urban ecology under global biodiversity loss. *BioScience*, biaa141. doi 10.1093/biosci/biaa141

MacGregor-Fors, I., **Rega-Brodsky, C. C.**, García-Arroyo, M., Gómez-Martínez, M. A., & Vázquez, L-B. 2020. Urban bird ecologists cite more publications from the Global North; why? *Journal of Urban Ecology* 6(1), juaa027. doi 10.1093/jue/juaa027

Neupane S., **Ghosh A.**, Gunther S., Martin K., Zurek L. 2020. *Culicoidibacter larvae* gen. nov., sp. nov., from the gastrointestinal tract of the biting midge (*Culicoides sonorensis*) larva, belongs to a novel lineage *Culicoidibacteraceae* fam. nov., *Culicoidibacterales* ord. nov. and *Culicoidibacteria* classis nov. of the phylum *Firmicutes*. *International Journal of Systematic and Evolutionary Microbiology* [doi: 10.1099/ijsem.0.004543, Online ahead of print]

Olson, E., Micciche A., Seigny, J.L., Ricke S.C., **Ghosh A.** 2020. Draft genome sequences of 11 bacterial strains isolated from commercial corn-based

poultry feed. *Microbiology Resource Announcements* 9 (16) e00170-20; DOI: 10.1128/MRA.00170-20

Snow, N., M.W. Callmander, J.W. Byng. 2020. Studies in Malagasy *Eugenia* (Myrtaceae) – VI: A new species with large leaves and coarsely and irregularly verrucose fruits. *Systematic Botany* 45: 274–276. <https://doi.org/10.1600/036364420X15862837791267>

Snow, N. 2020. Revision of New Caledonian *Gossia* (Myrtaceae). *Adansonia* 42: 131–177. <http://adansonia.com/42/7> (Corrigendum: 2020. *Adansonia*, sér. 3, 42 (7): 131)

Stacy, E., T. Sakishma, H. Tharp, and **N. Snow.** 2020. Isolation of *Metrosideros* ('Oh'ia) taxa on O'ahu increases with elevation and extreme environments. *Journal of Heredity* 2019 (electronically) doi:10.1093/jhered/esz069. Pp. 1–16.

Whitney, J.E., R. Waters, J.A. Holloway. 2020. Mud-dying the waters: investigating the generality of silt-resistance in mound-building *Nocomis* spp. using hornyhead chub (*Nocomis biguttatus*) and redspot chub (*Nocomis asper*). *Environmental Biology of Fishes* 103(7): 815-831.

Whitney, J.E., R. Waters, R., J.A. Holloway. 2020. Status of Hornyhead Chub (*Nocomis biguttatus*) and Redspot Chub (*Nocomis asper*) in Kansas. *Transactions of the Kansas Academy of Science* 12: 121-136.

Posters

Boroughs, K.L., **Whitney, J.E.**, Holloway, J.A., King, A.D., Catfish 2020- The Third International Catfish Symposium, Little Rock Arkansas, "Have Neosho Madtom (*Noturus placidus*) Densities Responded to Improved Water Quality in the Spring River of Southeastern Kansas?". (February 19, 2020).

Boroughs, K.L., **Whitney, J.E.**, Holloway, J.A., King, A.D., Kansas Natural Resources Conference, Manhattan, KS, "Have Neosho Madtom (*Noturus placidus*) Densities Responded to Improved Water Quality in the Spring River of Southeastern Kansas?" (January 30, 2020).

- Durbin, C., Bogarin, X., & Rega-Brodsky, C. C. 2020. Mammal community composition in forested mined land areas in southeast Kansas. Kansas Natural Resources Conference, Manhattan, KS. **Best Student Wildlife Poster Award.**
- Durbin, C., Bogarin, X., & Rega-Brodsky, C. C. 2020. Mammal community composition in forested mined land areas in southeast Kansas. Undergraduate Capitol Research Summit, Topeka, KS. **Best Undergraduate Poster Award.**
- Durbin, C., Bogarin, X., & Rega-Brodsky, C. C. 2020. Mammal community composition in forested mined land areas in southeast Kansas. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.
- Durbin, C., Bogarin, X., & Rega-Brodsky, C. C. 2020. Forested reclaimed mined lands support diverse mammal communities in southeast Kansas. Ecological Society of America Annual Meeting. Virtual Meeting.
- Findley, K. A., Wright, J., Rega-Brodsky, C. C., & George, A. D. 2020. Monitoring herpetofauna and birds on reclaimed mined lands in southeast Kansas. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.
- Hammesfahr, A., Rega-Brodsky, C. C., Womack-Bulliner, K., & Whitney, J. 2020. Are acoustic lures effective tools to increase imperiled bat captures? Graduate Capitol Research Summit, Topeka, Kansas.
- Hammesfahr, A., Rega-Brodsky, C. C., Womack-Bulliner, K., & Whitney, J. 2020. Are acoustic lures effective tools to increase imperiled bat captures? Missouri Natural Resources Conference, Osage Beach, Missouri.
- Henderson, A., Kruse, E., Sinclair, A., Witham, P., & Rega-Brodsky, C. C. 2020. Park visitor demographics and perceptions of nature in Southeast Kansas. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.
- King, A.D., Whitney, J.E., Holloway, J.A., Boroughs, K.L., Kansas Natural Resources Conference, Manhattan, KS, "Status of the Sunflower State's Ozarkian Fish Fauna". (January 30, 2020).
- Murray, M., Hammesfahr, A., & Rega-Brodsky, C. C. 2020. Comparison of bat species diversity within ponds and streams in southeastern Missouri. Undergraduate Capitol Research Summit, Topeka, KS.
- Murray, M., Hammesfahr, A., Rega-Brodsky, C. C., & Whitney, J. 2020. Imperiled bat capture rates: Examining effectiveness of an acoustic lure and impacts of habitat features. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.
- Rega-Brodsky, C. C., Smith, M., King, S. R., & Mallatt, K. 2020. Remediation of Tar Creek: Improving environmental quality and diversity over time. Kansas IDeA Network of Biomedical Research Excellence (K-INBRE). Wichita, Kansas.
- Smith, M., Rega-Brodsky, C.C., King, S. R., & Mallatt, K. 2020. Remediation of Tar Creek: Improving environmental quality and diversity over time. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.
- Taylor, B., & Rega-Brodsky, C.C. 2020. Deer reaction to car noise in an open field. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.

Oral Presentations

- Buckardt, E.M., C.C. Rega-Brodsky, and A.D. George. 2020. Herpetofauna Communities on Mined Lands in Southeast Kansas. 47th Annual Meeting of the Kansas Herpetological Society.
- George, A.D. 2020. Gray bats in Pittsburg, KS: research and monitoring. Kansas Bat Working Group, 13th Annual Kansas Natural Resource Conference, Manhattan, KS

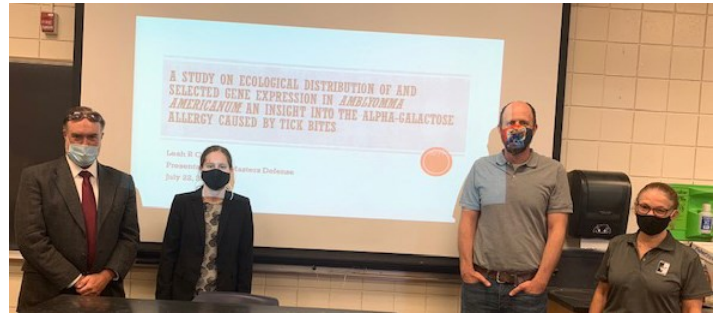
Headings, L.A., A.D. George, and C.C. Rega-Brodsky. 2020. Evaluating the avian and vegetative communities of Mined Land Wildlife Areas in Cherokee and Crawford counties. 72nd Annual Meeting of the Kanas Ornithological Society

McGinty, R.W., and A.D. George. 2020. Microclimate use by the gray bat colony in Pittsburg Kansas. 13th Annual Kansas Natural Resource Conference, Manhattan, KS.

Rega-Brodsky, C. C., King, S. R., Smith, M., & Mallatt, K. 2020. Remediation of the Tar Creek Superfund site: Shifts in bird communities over time. Ecological Society of America Annual Meeting. Virtual Meeting.

Taylor, B., & Rega-Brodsky, C.C. 2020. Deer reaction to car noise in an open field. Pittsburg State University Research Colloquium. Pittsburg, Kansas. Virtual Meeting.

Whitney, J.E., Bruckerhoff, L., Waters, R., Boroughs, K., Holloway, J., King, A. Kansas Natural Resources Conference, Manhattan, KS, "Deterministic and Stochastic Factors Influence the Distribution of Blackside Darter in Kansas". (January 30, 2020).



Above: Leah Cuthill (second from left) at MS thesis defense with committee members (Photo by Dr. Ghosh). Below: Ashlyn Henderson collects golden-rod soldier beetles (*Chauliognathus pensylvanicus*) at the Monahan during Terrestrial Field Ecology Lab.



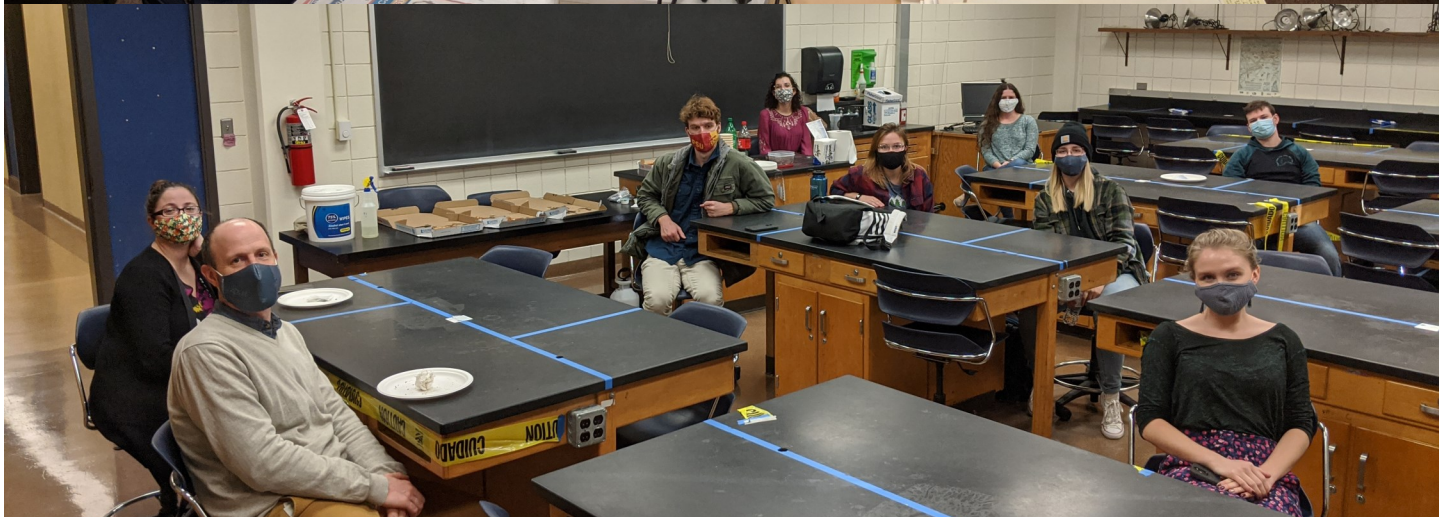
A Banded Sculpin (*Cottus carolinae*) captured from the Spring River below Empire Lake in Cherokee County on June 26, 2020. The Banded Sculpin is a species in need of conservation (SINC) in Kansas.



Top left: Senior Peyton Witham setting up an insect light trap to measure food availability for bats.

Top right: Freshman Belle Pfeifer with a western ratsnake (*Pantherophis obsoletus*) at the Kanas Herpetological Society (KHS) fall field trip in Bourbon Co.

Bottom: The KHS fall field trip campsite in Bourbon Co.



Top: Maggie Murray (L) and Maddie Gay keying specimens for Plant Taxonomy.

Middle: Haley's Pizza Party late in the fall semester to reflect and celebrate past accomplishments from the summer and fall (L to R): Drs. Brodksy and George, Ryan McGinty, Mary Whiteacre, Maggie Murray, Emma Burkardt, Peyton Whitham, Haley Price, and Luke Headings.

Left: Sydney Scoggins (L), Ryan McGinty, and Ty Gatton collecting specimens for plant taxonomy in Labette County.