



BioNews 2017

Department of Biology
Pittsburg State University



As I write this note, it is toward the end of enrollment for Spring Semester. Walking through the department as students are visiting with their advisors is an uplifting experience. Students and their Biology advisors are discussing enrollment, yes, but also exploring and explaining the ins and outs of the careers that the students are preparing to enter. Often the

discussions are one-on-one, but sometimes groups of several students are in on the conversation. Those groups gathered around a faculty office are lively and expansive, with the students' energy and enthusiasm on full display. It is fun to see, and catching snippets of the conversations reminds me of the broad range of knowledge and expertise that my colleagues possess, and of the privilege it is to work with them.

It is also on the downhill side of Fall Semester. Midterms are old news, and students are preparing to wrap up projects and prepare for exams that tend to fall right before they depart for Thanksgiving break. Yes, that also means that stress levels increase in proportion to the momentum of activities on and off campus, and are inversely proportional to the amount of rest the students are getting.

Students still stay up too late and then wonder why they can't concentrate on their studies. But those are the freshmen, and we get to see them grow into adults. I saw exciting data last month showing that in all but one of the past ten years, 80 – 100% of our students that applied for medical and professional schools at the end of their junior year were accepted into their programs. Those are fabulous numbers, and we are very proud of our students. Winter commencement is rapidly approaching, and our students crossing the stage that day are the inspiration and motivation that keeps us in the classroom.

Just in case no one else mentions it, we have several exciting projects at both the Research Reserve (Nature Reach) and the Monahan Field Sites. The Surface Mining Office at Frontenac (Murray Balk, Manager) are working with us to enhance road safety at the Research Reserve, and to address the issue of acid mine drainage at the Monahan. The project at the Research Reserve will relocate the pit that is too close to the county road, and in the process our field site will gain a native grassland area along the road and wetlands in the interior of the property. At the Monahan, a series of passive treatment ponds will channel acid mine drainage along a pathway of aerobic and anaerobic ponds to moderate the pH and remove metals from the acidic water. These projects will increase the value of our field sites for educational and research purposes, as well as address some fundamental problems that have existed for too long.

By the way, Murray is one of our Biology alumni, and I think he is just as excited as we are about working on these projects. Thanks Murray! And thank you to all of our alumni that keep us in mind and heart, and continue to support us in so many ways throughout each year.

Sincerely, Dixie Smith



Faculty Profiles

Dr. Joe Arruda — pg. 2

Dr. Christine Brodsky — pg. 3

Dr. Peter Chung — p. 4

Dr. James Dawson — p. 4

Dr. Andrew George — p. 5

Dr. Anu Ghosh — p. 6

Dr. Phillip Harries — p. 7

Dr. Hermann Nonnenmacher — p. 7

Dr. Mandy Peak Bryan — p. 8

Dr. Virginia Rider — p. 9

Dr. Neal Schmidt — p. 9

Dr. Neil Snow — p. 10

Dr. James Whitney — p. 11

Dr. Daniel Zurich — p. 12

Delia Lister — p. 12

Dr. Joe Arruda

Greeting to all of our alumni and friends. The next 1-3 years will see some changes coming to north and northeast edges of the



Monahan Outdoor Education Center. For several years, acid mine drainage from the north slope has been seeping into the ditch and downstream on the property. The US Dept of Interior Office of Surface Mining has completed a water quality study, and using our previous data and their new data, have developed a preliminary remediation project. Final design will occur next

and, perhaps ground work will commence in a year or so.



Weir at the Monahan Outdoor Education Center.

For the Department, I continue to wrangle our Facebook page and run department assessment numbers for administration. The field faculty are in the middle of remodeling the curriculum – more of a daunting task than I thought it would be, but we are making progress.



Bladetooth Wedge (*Xolotrema fosteri*)

I am completing my Kansas land snail survey. I can probably manage one more season. I've enumerated a possible 72 species and found two new species to the state – the Bladetooth Wedge (*Xolotrema fosteri*) and the Perforate Dome (*Ventridens demissus*).



Perforate Dome (*Ventridens demissus*).

Dr. Christine Brodsky



Hello everyone!

I cannot believe it has now been over a year since I've joined the Department of Biology! It's been quite the exciting year starting some fun research projects, teaching some of my favorite courses, and getting to know so many of you.

Summer is a distant memory, but I had a great summer jam-packed with research projects, conferences (Ecological Society of America), and my husband and I buying our first home (and now having a never-ending list of home projects!).

A new research project I collected data for this summer is a joint project with the Quapaw Environmental Office. Along with Kelly Mallatt and Ashlyn Parmley, we surveyed the response of the bird community to remediation efforts at the Tar Creek Superfund site. We are hoping that this project will be a long-term study, so next summer I'll need more field assistants. If this sounds like something interesting to you and you don't mind waking up too early, please let me know!



Surveying Tar Creek for changes in the bird community following habitat remediation. (L-R, Kelly Mallatt, me, Ashlyn Parmley).

This past year I traveled back and forth to Baltimore to continue my research there. It's been exhausting, but so incredible. Over summer, I was able to visit with teachers and students at Francis Scott Key Elementary/Middle School to teach them about the importance of urban birds and greenspace habitats (image in next column). I was fortunate to get a summer fellowship through the university so I could collaborate with Mahan Rykiel, a landscape architecture firm, to do a schoolyard greening project, that we now call Project Birdland. With the firm, many more Baltimore organizations, and the local community, we

planted over 3,000 plants in the schoolyard and installed bird nest boxes! We hope that transforming this schoolyard will improve local bird community diversity and give these students a new schoolyard and talking with them in their STEM classes will promote greater connections to nature and urban wildlife.

A favorite part of my job so far is to work with students on research projects. Last Spring, Katie McMurry started her Master's thesis project studying the impacts of homeowner management practices on bird and butterfly diversity in Pittsburg residential yards. Kelly Mallatt also worked with me in the Spring to present a poster at the Research Colloquium and won 3rd place for her work on water quality across an urban to rural gradient in Galena. Emily Fry is now working on a project to map campus trees to assess carbon sequestration rates and the cognitive impacts of interacting with nature. Kudos to all of them for really interesting projects and their hard work!



Project Birdland organizers with Baltimore Mayor Catherine Pugh (black dress) at the Community Build Day for Francis Scott Key Elementary/Middle School (August 2017).

Classes have also been a lot of fun and another favorite aspect of my job (can you sense a pattern?!). Last Spring, I taught Urban Ecology for the first time and that was such a great experience. We were able to travel to Picher, OK; Joplin, MO; and Kansas City, MO/KS to meet with environmental scientists, landscape architects, a nature center director, and a community garden organizer to talk about issues in urban ecology. This semester, I'm having a blast teaching Animal Behavior and getting students out in the field to observe various behaviors of both wild and captive animals. New this year, I am also teaching the Organismic and Environmental Biology Orientation (OEBO) course for all the new 'field' biology majors. We have been meeting weekly to discuss potential careers and meet with a variety of professionals to talk about career preparation and learn about what they do. Welcome new OEBO students!

Next semester, I will be teaching ELS again and also offering a new course: Human Dimensions of Natural Resource Management (Topics BIOL 602*16)! If you have ever wondered how some of our wildlife management decisions impact people, or how to even go about surveying those kinds of issues, this would be a great class to take! I am already so excited to teach this course and I hope many of you are excited to take it.

Dr. Peter Chung



Hello all and Happy Holidays as 2017 ends. It has been quite an eventful year.

Our research lab has stayed busy this year, a bit smaller following the successful theses defenses and graduations of Kayla and Myles. September received a distinguished K-INBRE Star Trainee research award for her senior year. Quite an accomplishment for her! She has been busy working on the lab project as well as applying for graduate

schools. We wish her the best success. Samuel and Kiralyn are working diligently on their projects; we look forward to them defending their theses in May.

Classes are humming right along. In light of budget cuts, we have been working on ways to be more efficient and trim what little fat we have in the prep lab. Kim, as always, keeps the ship upright and going in the right direction.

A few thoughts....We successfully hosted over 734 high school students for the 2017 Science Day event, organized by the PSU Biology Club with the support and assistance of everyone in the Department, along with Physics and Chemistry. Special thanks to the members of the Biology Club executive team for making it happen! Science Day 2018 will take place Thursday, February 22, 2018.

We are always looking forward to meeting with prospective students interested in our Department. Contact us if you know of someone interested in Biology at Pitt State. Graduation ceremonies are a great opportunity to come back and visit, so if you ever make it back...

Congrats to our May graduates who got accepted into professional school or Med Tech clinicals. Good luck to everyone still waiting to hear. We wish you the very best.

Some dates to keep an eye on in 2018:

February 22: Science Day

April 5: PrePT Open House and Pre-PT Student Orientation

Spring 2018 (tentative)- Department end of the year picnic, sponsored by the PreMed Club

Fall 2018 (tentative)- Department Welcome Back picnic, sponsored by the Biology Club

Stay tuned for the dates for the 2018 Biology Department Christmas Lunch

There is always more to be said, but I leave you with my usual farewell:

To all our graduates, colleagues and friends, don't be strangers; stay in contact, keep in touch, and do stop by and visit if and when you are in town.

Regards, Dr. Peter Chung (pchung@pittstate.edu)

Dr. James Dawson



My greatest accomplishment this year was graduating Nathan Elliott. His problem was entitled: *The Production of Antimicrobial Compounds by Freshwater Green Microalgae*.

Secondarily is the Living Learning Community experiment, which we have yet to see if it will work out.



Mallory Gibson, Hanna Thomas, and Hawra Khiliti



Dr. Andy George



Hello everyone. As expected, 2017 has been full of new and exciting activities.

First, I had the opportunity to teach Herpetology for the first time in several years. We had a terrific group of 12 students enrolled in the spring class. The most memorable part of the semester was probably our trip to southwest Arkansas. We stayed at Ouachita

Mountains Biological Station, and spent the weekend exploring the region's unique herpetofauna. Other semester highlights included a chilly but productive trip to the Flint Hills, and weekly collecting trips to many locations in southeast Kansas. The herping continued well past the end of the spring semester. I took groups of students to the official spring, summer, and fall field trips of the Kansas Herpetological Society, each in a unique region of the state. My favorite was probably the July field trip to the Smoky Hills. A rainstorm on the second night of the trip brought out high numbers of amphibians that are almost never observed during summer.

As many of you may know, a small colony of federally-endangered gray bats roosts in Pittsburg. With funding from the Kansas Dept. of Wildlife (KDWPT) I have revived efforts to monitor the colony, and to determine whether it has been affected



An Ozark Big-eared Bat in eastern Oklahoma

by white-nose syndrome. Two students (Derek Scholes and Nate Skinner) spent the summer counting bats using an infrared camera system and acoustic bat detectors. We also began a local banding study, which will allow us to examine population de-

mographics and link up with other bat projects in the region. In September, three students and I traveled to eastern Oklahoma to help with a larger bat-banding project. We worked with researchers from universities, federal and state agencies, and a consulting firm to band more than 300 bats of various species over two nights.

I am happy to announce that two new grad students joined the lab this fall. Michael Barnes and David Hollie hail from Tennessee and Georgia, respectively. Both will be studying the effects of forest management on bird communities as part of the Missouri Ozark Forest Ecosystem Project (MOFEP). Their projects



Michael Barnes with a bullsnake in central Kansas

are funded by the Missouri Dept. of Conservation. David and Michael are both outstanding students who will make great additions to our program.

There were several other highlights from 2017 that I will only mention in passing. My students and/or I judged an elementary school science fair, assisted KDWPT with a mussel survey, attended two conferences, gave six research talks, and had a paper published in *Ecology and Evolution*. Check out the cover of the November issue (bottom right, page 4)!

Dr. Anuradha Ghosh



Season's Greetings to All!

This year has been productive in its true sense: my first Masters student Rachel defended her thesis successfully, two of my co-authored research articles have been published in peer-reviewed journals, and I had a baby!! Another accomplishment I had this year was teaching a fully online course.

Rachel's thesis was entitled *Bacterial diversity at an abandoned coal*

mine in southeast Kansas.

This spring I thoroughly enjoyed teaching Microbial Physiology (Lecture & Lab). This was an existing course that I revamped by introducing concepts of whole genome sequencing and its application. I highly appreciate Dr. Rider's help with setting up INBRE collaboration for this course. Students were elated to have hands-on experience on genome annotation and finding their genes of interest. Another fun part of the course was brewing beer in the lab and a trip to the Boulevard KC. I was glad to have a bunch of youthful and inquisitive students in my class. I like to implement the knowledge of genomics in my future research on *"Microbial Food Safety and Quality Control"*. Elena will be working on this project as her Masters thesis.

Another spring taught class was Environmental Health. I included a sustainability component in this class and it was well received by the students. I believe I could successfully instill an overall awareness of their immediate environment as well as stimulate their thoughts for sustainability of future generations. Other classes I taught were General Biology Lecture & Lab (in summer) and Toxicology & Human Health (in fall).

In summer, I attended the Master Advisor Training organized by Gorilla Advising Academy Council. It was a wonderful opportunity to interact with experienced faculty members across campus and to know of various means of advisement available in other departments. The webinars and talks offered by Center for Teaching, Learning, and Technology greatly improved my online and hybrid course design as well as sharpened my advising skills. Also, I had a fruitful visit to Kansas City University of Medicine and Biosciences (Joplin, MO) on Advisor Day event that discussed curriculum overview and admission requirements for the school.

Besides teaching and advising, I was able to continue an active research in my lab. *"Soil Bacterial Diversity of Abandoned Coal Mine"* and *"Understanding the Tick-Pathogen Interactions"*

both these lab projects have local interests for which I am seeking local funding. The receipt of Walton Family Foundation Grant was truly encouraging. Currently, I have four undergrad (junior & senior) research assistants in the lab. Nick is helping my Masters student Abrar with the tick-pathogen project. I have initiated a collaborative project with PSU Polymer Chemistry on *"The Bactericidal Effects of Silver Nanoparticles"* which has granted John a KINBRE Summer/Semester Scholars Award. Another interesting project on *"Prevalence of Antibiotic Resistant Microbes in Community Household Environments"* is being carried out by Rebekah and Jada. Recently, Rebekah presented this work as a poster at an out-of-state conference. My former undergrad research assistants attested the fact that lab experience helped them to get into well-paid internship programs.

Progress of our research was acknowledged at the PSU Research Colloquium held in April this year. There were a total of four posters presented by Abar, Ghaidaa, Marcus, Mikaleigh, and Sam (senior at Carl Junction High School) and an oral presentation by Rachel. Rachel also presented her research in two other occasions: at American Society for Microbiology Missouri Valley Branch Meeting (held in Missouri State University, Springfield, MO) and 14th Annual Capitol Graduate Research Summit (Topeka, KS) and received Best Poster Awards for both. Abrar received a runner-up award in the category of Graduate Poster Presentation at the colloquium. The presentations and awards are a boost in their academic career and an incentive to my scholarship. I am hoping to get more financial support from the regional sources and PSU Research and Grants Administration in future.

The rest of the time I enjoyed assisting in PittCare, Rumble in the Jungle, Science Bowl; visiting with prospective students; serving the Biology Graduate Committee; and of course, attending the newest addition to my family front.

I look forward to another exciting year ahead. Happy New Year to all the readers and well-wishers of our Biology department!



KU Medical School Hooding ceremony. (L to R): Andrea Petersen Stand, Dr. Peak and Zach Krumsick.

Dr. Phillip Harries



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, Senior Seminar, Biology of Cancer and Bioethics. Since Dr. Wu left Pitt State for UMKC in the spring, I have also picked up the Virology course that she used to teach. I've really been enjoying this one since I did my postdoc in a virology lab and still have a definite research

interest in viruses. In fact, I was recently invited to join the Center for Viral Pathogenesis at KU medical center which is a consortium of virologists whose aim is to advance research and education related to viruses.

It is critical to have a clear picture of which viruses are present in this economically important crop so that if an epidemic begins to cause damage, growers can quickly identify the source of the problem and react before crop losses become catastrophic.



Senior Abbie Morgan purifies DNA from an agarose gel as part of her iGEM research project.

My collaborator has had great success doing similar work with the Oklahoma soybean crop so I'm very hopeful that the funding comes through and we can pursue this work!

I'm also currently working with an industrious undergraduate research student, Abbi Morgan (pictured below) on a new project related to synthetic biology. My lab recently joined the iGEM (International Genetically Engineered Machine) foundation. This organization takes an engineering style approach to genetic modification (primarily in bacteria) with the goal of making biological machines that can perform useful functions. Genetic "parts" that all adhere to the same basic structural standard are synthesized by researchers around the world and distributed to participating labs. These parts, called "biobricks", can then be combined in novel ways to create living cells that can perform new and useful functions. At the moment, we are simply making sure we are comfortable with all the protocols necessary to combine parts before embarking on our own iGEM voyage. Hopefully I will have some new info to share in next year's newsletter.

On a personal note, my two sons are both in High school this year so they (and my wife and I) have been busy with all the activities that go along with band, theatre, and sports. I have also continued to pursue my photography hobby and actually sold my first cover photo this summer to Kansas Wildlife and Parks Magazine. This was the first time I had ever sold an image and it was pretty exciting to get to see it in print! I hope everyone is doing well and best wishes to all for a healthy and happy year!

Dr. Hermann Nonnenmacher



In the spring, 2017 semester, Adam King took a break from assisting with bumble bee collections and helped me to produce a research poster about Trevor Burrows's summer and fall, 2014, collections of insects and pollen samples. These samples, and their data, were acquired in southeast Kansas on tall thistle and late boneset plant species, and insect forager data included behavioral observations.

In April, Adam presented his work on Trevor's findings at the 2017 Annual Meeting of the Kansas Academy of Science, at Ft. Hays State University, Hays, KS, and at the 2017 PSU student research colloquium. While at Fort Hays State University, we toured many collections of plants, insects, and vertebrates, and then toured the paleontology research and collections area. Adam's and Trevor's work is a valuable addition to work completed by Sam Young (Fall, 2013) and Karen Stoehr (Fall, 2015). Adam King produced excellent photos for the updated research and did a great job explaining the work to judges at both venues. Adam's efforts placed second in overall undergraduate research poster competition (first in biology) at the PSU colloquium, hosted by the College of Graduate and Continuing Studies.

Dr. Mandy Peak Bryan



2017 was full of teaching, advising, committee meetings, mock interviews, writing letters of recommendation, reading, grading papers, research, running, and loving life! The Biology Department participated in numerous recruitment and advisement events, including Crimson and Gold Days, Rumble in the Jungle, Junior Jungle Day, Physical Therapy Open House, and summer sessions of enrollment during Pitt C.A.R.E.S. I was granted the opportunity to teach a Learning Living Community Freshman Experience class this Fall. This class is associated with our Principle of Biology I course and is populated with Biology, Exercise Science, and Nursing students. If the students live in the dorms, they live either in Nation or Dellinger Halls. Overall, it was a great experience!

Also, Peter Chung and I were recognized by the PSU Athletics Council for providing exceptional support for the athletics teams. Peter was selected by the Woman's Cross Country team and I was selected by the Football team team. It was an honor!

Several of our students have interviews at medical, dental, PA, veterinary, and physical therapy schools and we wish them luck! Finally, this leads to a few shout outs to my advisees, student assistants, and study abroad students that are either accepted or currently attending their first year in professional schools, including, Tayita Abudu (Master in Public Health-KU), Ashley Eichelberger (Master in Anesthesia- UMKC), Abby Wiens (UMKC Dental), Ty Worthington (PA-Wichita), Addison Torchia (OT School), Brandee Main (ARCOM), Jacki Huse (ARCOM), Buster Reddick (OSU-COM), and Cody Spencer (Missouri State University PT School). Finally, a huge shout out to Ms. Katelyn Flood for her acceptance into Optometry School and being selected as PSU Outstanding Senior!

Finally, I attended the 2017 Hooding Ceremony for the University of Kansas School of Medicine. The students moved on to their residency programs this summer (which I listed next to their name). A huge congrats to Drs. Sara Verga (Psychiatry; OU), Zach Krumsick (Emergency Medicine; Vanderbilt), Andrea Petersen Stand (Medicine; Uni of Colorado) Ryan Sorrel (Family Med; Indiana), Mitch Ayers (Fam Med; Naval Hospital, San Diego), Kyle Renner (Family Med; Idaho), Lauren Porter Hughes (Peds; KU), and Dyllan Landry (Surgery; KU) for graduating from KU med school and for their residency positions! Also, Dr. Taylor Tristan Doane graduated with her MD from the University of Oklahoma and is currently a resident in Pathology at Emory. And two of our alumni graduated from Missouri School of Dentistry this summer; congrats to Drs. Kyle Orr and Drue Barton!



Adam King (above) explains our research to one of the competition judges. His efforts were rewarded (below).



In addition to providing research opportunities to our students, recruiting future ones and serving those enrolled, remains a top priority. In addition to our courses and student interactions, we have had many opportunities to help those considering PSU as their choice for a quality higher education. Several of us in the department assisted by meeting good numbers of visitors through our Majors Fair (20 students visited our table) and also the new and popular PSU Crimson and Gold Days events (50-60 registered high school seniors have visited our tables so far), as well as many individualized meetings between prospective students and faculty advisors across all emphasis areas we offer.

Dr. Virginia Rider



Greetings to all friends of the Biology Department. Another year of success for students who applied to a variety of professional schools. Those accepted to professional schools are:

Tayita Abudu, MS Public Health, Wichita; Alexandra Blanchard, Burrell College Osteopathic Medicine, New Mexico; Jayden Bowen, MD/PhD program, University of Iowa; Anthony Diskin, UMKC School of Dentistry; Katelyn Flood, University of St. Louis, Optometry;

Laci Hadorn, KCU School of Osteopathic Medicine, Kansas City; Kurt Herron, AT Stills College of Osteopathic Medicine, Kirksville; Jacki Huse, AR College of Osteopathic Medicine, Arkansas; Brandee Main, AR College of Osteopathic Medicine, Arkansas; Evan Noel, PhD program University of Texas-Southwestern Medical Center; Yegor Paschenko, KU Medical School; Buster Reddick, OSU Osteopathic Medical School, Tyler Shelby, MD/PhD, Yale; Hannah Thomas, PhD, Cornell; Abigail Wiens, UMKC School of Dentistry; Kalee Woody, KCU Osteopathic Medical School, Joplin; Tyler Worthington, Physician Assistant Program, Wichita. Congratulations to all. If I have overlooked anyone, please let me know as we enjoy following you and your career successes. Although students who are applying for 2018 admissions are still in the interview process, we have three students who were accepted early decision to KU Medical School. The deserving students are Gage Davies, Alex Hill and Rosa Mendez. Nate Grimaldi is accepted to AR College of Osteopathic Medicine but he is still in the interview process.

The fifteenth Annual K-INBRE Symposium was held at K-STATE in Manhattan, KS. Unfortunately, the weather forecast predicted severe ice storms and we decided it was not a good time to be out on the road. There were many disappointed undergraduate and graduate students who were excited about presenting their research and this conference. We look forward to attending the sixteenth annual K-INBRE meeting in January, which will be held in Kansas City.

Research continues to progress in my laboratory. Three students working in the laboratory presented at the PSU Research Colloquium held April 6, 2017. Hawra Khlitit (graduate student) won third place for her oral presentation and Hannah Thomas (undergraduate) won second place for her oral presentation. Mallory Gibson presented a very nice poster showing that Wingless 4 (WNT4) does not regulate stromal cell proliferation.

Hawra Khlitit completed a very nice Master's thesis project and graduate in May. She was invited to submit her research to a reputable journal and we are working on getting the manuscript prepared for submission. After a few bumps in the road, Ashleigh Elbert is continuing her Master's research project in the laboratory. Unfortunately, Ashleigh was sidetracked over the summer with some serious back issues. Following recent sur-

gery, she is now on the mend and has resumed her research project. Two undergraduate students, Hannah Thomas and Mallory Gibson, enjoyed great success with their research projects. Hannah and I attended the annual Endocrine Society Meeting in Orlando, Florida. Hannah presented a poster titled "The Spatial Expression of the T Cell Homing Receptor, CCR7, is Differentially Regulated by Progesterone and Estradiol in the Rat Uterus." The activity at her poster was non-stop for the full two hours of the session. Hannah was left a note on her poster by a journal editor asking her to submit the results for publication.

A paper published in the *Journal of Endocrinology* last year titled "Wingless (WNT) signaling is a progesterone target for rat uterine stromal cell proliferation" with 5 student co-authors was one of the most downloaded publications from the *Journal of Endocrinology*. We received a certificate of recognition from the journal. Go PittState students!! I attended a superb research conference at the Stower's Research Institute in Kansas City this summer. It was an excellent conference and I felt gratified to be part of science at this time when many exciting discoveries are still being made.

Dr. Garner continues to help our students gain experience in a medical setting through the Premeds with Promise program while other PSU alumni (Drs. Dunbar, Fenech, Jensen, Noordhoek, Stewart, Sandness) continue to mentor our premedical students and help them gain admission into medical school. The participation of the local health care providers and, PSU alumni, contributes directly to the success of our prehealth programs.

We are very lucky to have had such an outstanding number of students who come to the Biology Department for their higher education. Your accomplishments are always such a pleasure for us so please don't hesitate to stop in and visit when you are in the Pittsburg area. As always, I send you my best wishes for your continued successes.

Dr. Neal Schmidt

I have been keeping busy with the Anatomy and Physiology lecture and lab courses this semester and I am teaching the Human Anatomy course, as well.



I attended the Human Anatomy and Physiology Society (HAPS) annual meeting in May in Salt Lake City, Utah. I have served as Chair of the Safety Committee for several years. Congratulations to all my advisees and other students that have moved on to professional school, graduate school, or the workplace. Thanks to my students and assistants for their solid efforts

in my courses over the last year. Keep moving forward and stay the course! As always, I am grateful for the opportunities to work with our students and appreciate all the support I have received over the past year. Have a great holiday season!

Dr. Neil Snow



The Sperry Herbarium can look back on 2017 with a genuine sense of accomplishment, which included a lot of curatorial activity in all categories. In addition, we published the results of a 2-year study for the Grand River Dam Authority and documented 104 new records of vascular plants (including 4 state records) for Ottawa County, Oklahoma. Students Samantha Young and Chance Curran were instrumental in that project. ([http://](http://www.phytoneuron.net/2017Phytoneuron/26PhytoN-NeoshoFlora.pdf)

www.phytoneuron.net/2017Phytoneuron/26PhytoN-NeoshoFlora.pdf)

A new project was initiated with generous funding from Dr. Phil Eastep of Cherryvale, documenting the vascular plants on his property in Montgomery County. Students Jared Simon and Bryce Ragatz were the primary participants. That project is ongoing and has documented approximately 450 species of plants, with more still being discovered.

In December, Natalia Agostini Schneider successfully defended her thesis, entitled: *Herpetology Collections at Pittsburg State University: Assessing Collecting Patterns and Analysis of Spatial and Temporal Origins of Specimens*.



Natalia (center front in white sweater) celebrating her thesis defense with family and friends.

A couple of weeks after Natalia, Fabio Giacomelli defended his thesis, entitled: *The Richness and Relative Abundance of Small Mammals in Old Surface Coal-Mined Sites in Crawford and Cher*

sokee Counties, Kansas, which was directed by Emeritus Professor Dr. Steve Ford.

I submitted a proposal to the National Science Foundation in August for infrastructure support of the Sperry Herbarium. Five students assisted with specimen preparation, data basing, filing and digitization. Thanks to Karisa Boyer, Kelly Mallet, Jiawei Xu, Jared Simon and Bryce Ragatz. A summary of 2017 herbarium activities is available from the Sperry Herbarium website:

<http://www.pittstate.edu/dotAsset/e15651c6-348d-41f9-b386-32ac75eff465.pdf>

On the publishing front, colleagues and I transferred species of the Myrtle genus *Piliocalyx* to the *Syzygium*, most of which occur in New Caledonia. With a different set of colleagues, we had a paper accepted that describes population variation in the "ohia" tree of Hawaii on the island of Oahu. A third set of colleagues and I have a monograph in press in *PhytoKeys* on the grass genus *Diplachne*, which has a nearly worldwide distribution, and which I have been studying for over 30 years. I also published a short paper documenting three first records of vascular plants occurring in Kansas. Several other publications are in various stages of the production pipelines. Over Thanksgiving Break I spent nine days at the Missouri Botanical Garden working on research related to the Myrtle family in New Caledonia, Madagascar, and another grass-related project.

A new service area is a four-year term an Associate Editor for *Systematic Botany*, the publication of the American Society of Plant Taxonomists. I wrote a review for this journal of a new book entitled *Grasses of the Great Plains* and shepherded eight manuscripts during the year.

A new course offered this year was *Grass Taxonomy*, which will be taught fall semester of odd years. Grasses are the most economically and ecologically important family of plants on earth.

The faculty associated with ecology and field biology has spent much time revamping our curriculum this year. This process will lead to a modernized and improved curriculum for our students.

We are happy with the opportunities we provide for our students, in particular the level of individual attention they receive, and hands-on experiences gained at Pittsburg State University.

Congratulations to our graduates this year. Stay in touch.

Lest I forget, a shout-out to Mark Flood and Lynn Gratham, who keep our computers running and reduce our blood pressure. You guys are great!

Neil

Dr. James Whitney



2017 marked the beginning of my second year as an assistant professor in Biology at Pittsburg State University.

During the Spring semester I taught Biometry, Principles of Ecology, Environmental Life Sciences (ELS), and a topics class titled Research in Stream Fish Ecology. The topics class was a lot of fun to teach, because we spent a majority of class time doing stream fish sampling in the Cow Creek Basin

using a combination of backpack electrofishing and seining, in addition to quantifying stream habitat characteristics (Fig. 1). The purpose of this sampling was to compare our contemporary data on Cow Creek fish communities and habitat to historical surveys done in the 1960s and 1990s to examine long-term change. We also attended two professional conferences as part of this class, including the Kansas Natural Resources Conference (KNRC) in Wichita, KS on January 26-27th, and the Southwestern Association of Naturalists (SWAN) meeting in Lawton, OK on April 13-16th (Fig. 2). Field trips were a major component of Stream Ecology, which I taught the first time in Fall semester.

In Stream Ecology we continued the fish and habitat sampling from Spring semester by traveling to more sites in the Cow Creek Basin, and added macroinvertebrate sampling to our protocol (Fig. 3). I also taught Ecology, ELS, and ELS lab during the Fall semester. The Spring 2018 semester looks to be another fun one, as I will be teaching Ecology, Biometry, and Ichthyology.

Similar to 2016, 2017 was a balance of finishing up projects from my PhD and postdoctoral work while also trying to get new projects off the ground. As part of finishing up my PhD work, I gave an oral presentation at the SWAN meeting over some otolith microchemistry research I was part of in the upper Gila River Basin, NM, and I also helped with finishing up a paper on upper Gila River fish genetics. Furthermore, for the tenth October in a row I traveled down to the Gila River to help with ongoing monitoring of aquatic communities recovering from past wildfire and flood disturbances. This October Gila sampling trip was probably the most interesting one yet, as it revealed that several native fish species that were decimated by wildfires and floods during 2011-2013 had finally made a full recovery, which was encouraging to see. Finishing my postdoctoral work included

putting the final touches on some manuscripts concerning fishes of the Colorado River basin and their potential range shifts in response to climate change. Several co-authors and I also finished up a chapter for a book on intermittent rivers and ephemeral streams that is scheduled to be published in December 2017.

In terms of new research projects, sampling the Cow Creek Basin fish community to examine long-term change was a major focus. In addition to sampling done during class field trips, PSU undergraduate students Josh Holloway, Alex King, and Derek Scholes volunteered their time to help with sampling over the summer break. We plan to analyze and write up the results of this sampling over the winter, and will have an oral presentation ready for the KNRC conference in Manhattan, KS in February 2018. One of the more interesting finds of this project so far was our documentation of the Arkansas Darter (*Etheostoma cragini*) at three sites in the Cow Creek Basin, where it previously had not been found (Fig. 4). The Arkansas Darter is a threatened species in Kansas and is a candidate for threatened status under the Endangered Species Act (1973), thus our findings could have implications for conservation decisions. The other new research project I was involved with was in cooperation with the Kansas Department of Wildlife, Parks, and Tourism. The objectives of this project are to quantify the current status of the Hornyhead Chub (*Nocomis biguttatus*) and Redspot Chub (*Nocomis asper*) in Kansas, which are both listed as threatened species in the state (Fig. 5). This information will be used in the development of a formal species recovery plan, and will involve sampling throughout several streams in the Marais des Cygnes and Spring River Basins during the summer of 2018. As such, it looks like summer 2018 will involve a lot of time in the water, which is exactly how I like to spend my summers.

2017 wasn't all about teaching and research, as there were several events in my personal life that were pretty exciting too. Chief among those was the first birthday of our daughter Audrey on August 4th, 2017. Audrey is becoming more mobile and vocal all the time, and it has been a lot of fun to watch her develop. My wife and I are looking forward to continue watching her grow in 2018. Audrey and her dislike of car seats has made it more difficult for us to go on extended trips, but we did make it down to Roaring River State Park in Cassville, MO in June, and to the Bentonville/Fayetteville, AR area for a quick vacation before school started in August.

In conclusion, 2017 was an exciting year with a lot of new beginnings. Here's to hoping 2018 is just as good.

Dr. Dan Zurek



Research on the soybean antibiotic project is wrapping up, as Gage Davies is currently assessing toxicity to mammalian cells of our novel protein. Even if it proves somewhat toxic, it will still be viable as a topical application with potential applications to otherwise resistant gram negative infections. The charcoal rot resistant soybean project is moving forward with an inducible promoter instead of a constitutive one: Adriana Sosa is currently pursuing this project in mylab. I also led a medical service

trip to Belize last summer with fourteen students, and am putting together another one for summer of 2018. What a great opportunity for our graduates who now have medical degrees to come back to Pitt (hint hint...)

My graduate student Jana Jo Gannaway defended her this in December, entitled *Quantitative Analysis of Tetrahydrocannabinol for forensic application in seized drugs*.

Delia Lister



Greetings from Nature Reach!

It has been a wonderful year so far. This fall has been full of programming and teaching. As usual, my summer was quite busy but the highlights came very early. I was fortunate enough to take four students to the Peruvian Amazon in late May. Some of you might have taken that trip with Dr. Timme over the years. It's wonderful to have a Pitt State connection with Explorama Lodges in Iquitos, Peru, and to know students will

get a quality experience in the Amazon. Many of the guides and staff have stayed the same over the years and recognize the Pitt State logo (see photo, top right).

Just three days upon return from Peru I was off for another adventure. I was one of fifty environmental educators from across the US to be selected for a leadership clinic with the North

American Association for Environmental Education. The clinic was held at the National Conservation Training Center in Shepherdstown, WV. The facility was quite wonderful and the training invaluable.



Photo from Peru (Left to Right): Peruvian Guide Celso Hidalgo Riz and students Logan Houk, Morgan Houk, Jessica Harrington, and Emily Allen.

Once travels were over I helped host another teacher workshop, this time hosted at the Southeast Kansas Nature Center. Summer camp followed soon after with 14 campers and 4 kid "volunteers." Many thanks to Bob Mangile, Donna Smith and the Sperry-Galligar Audubon Society for helping with the camp!

One of the big hits of the summer was our Pre-K reading program. Three to five year olds were invited to come to a book reading featuring a Nature Reach animal ambassador. We had 4 sessions over the summer and each session had wait lists. Many thanks to my student intern, Katie McMurry for helping with that program. I really should brag on all of my student workers. If it weren't for all of their hard work "behind the scenes" I Nature Reach would have a hard time existing.

As for our regular school programming, we were again generously funded by a donor to help cover the cost of programming for local schools. We were able to provide 139 programs to a little over 4,000 students in 19 communities in the region. During the Spring 17 semester I taught my first Natural History Interpretation class. I had six students earn the Certified Interpretive Guide credential. We all enjoyed the class, and I hope I will be able to teach it again in the future.

Finally, our newest addition to the program is "Matilda" the Virginia opossum (see page 1, top right). She is from a rehab center near Lawrence, KS. We have just had her since the beginning of August and she already has quite a fan club! I hope she will help people see these marsupials in a more positive light.

Photo Gallery 2017

Top (L): Honors college graduates, Spring semester; (C): Dr. George collecting bat guano; (R) An undescribed species of *Syzygium* with cherry-sized fruits from New Caledonia. Upper Middle: (L): Megan Corrigan and Natalia Schneider searching for herps in Arkansas; (C) Male and female five-lined skinks; (R) Rumble in the Jungle, Drs. Brodksy, Ghosh and Nonnemacher. Lower Middle: Hannah Thomas (L) and Mallory Gibson (R) giving poster sessions. Bottom: Graduation (L to R) Dr. Chung, Alexander Hill, Keith Walton, Jada Caplinger, Dr. Nonnenmacher, Wes Brantley, Dr. Brodsky, Jared Simon, and Samuel Stephens.

