Fall 2013

The Alumnidae

Department of Zoology, Life Sciences West 501
http://zoology.okstate.edu
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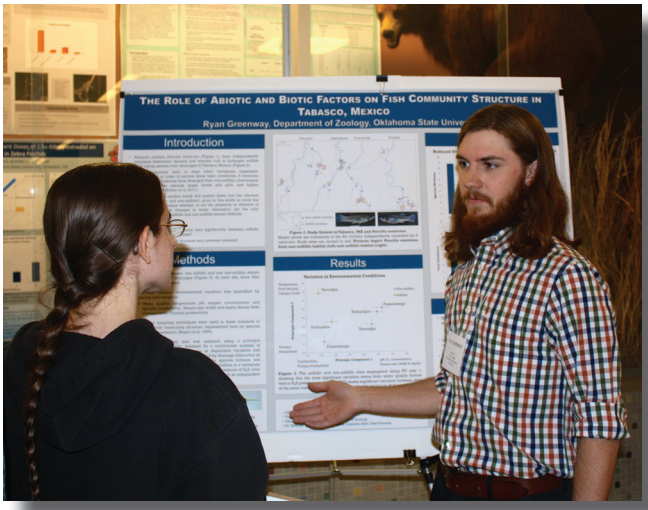
Third Karen L. Smith Undergraduate Research Symposium

On 22 November the lobby of Life Sciences West filled up once again to honor the late Karen Smith by showcasing undergraduate research projects in the Life Sciences. The symposium was established in November 2012 in honor and recognition of Karen Smith's exceptional service to undergraduates at Oklahoma State University. Seventeen undergraduate students presented their research in topics ranging from the effects of contaminants on animals to the behavior of Atlantic Bottlenose Dolphins in captivity. Karen graduated from OSU with her Bachelor of Science in Physiology and her Master of Science in Psychology, and she later returned to OSU as a senior academic counselor in the College of Arts and Sciences. Karen strongly encouraged students to participate in professional development opportunities and she was instrumental in designing this opportunity for students to present the results of their research in a professional setting. Undergraduate students presented posters describing their research to an audience of more than 150 faculty, graduate students, and undergraduate students. The Karen L. Smith Undergraduate Research Excellence Award was given to **Ryan Greenway** (senior Zoology major, photo above) for his research with **Dr. Michael Tobler** on the role of abiotic and biotic factors on fish community structure in Tabasco, Mexico. The award includes $200 and will be given to the best student presentation at the symposium every Fall and Spring semester.



If you would like to help support this symposium please see page 5 of this newsletter.

Greetings from the Department Head

I hope you are all enjoying this beautiful Fall weather. The Zoology Department has welcomed another excellent group of students. The undergraduate enrollment is at 660 students and the graduate student enrollment is at 67. As you will see in this installment we also had two new terrific faculty join us this Fall, Drs. Polly Campbell and Sarah DuRant. One is a replacement for Dr. Stanley Fox who retired this past summer (although officially retired, Stan continues to be very active on the research front - see page 2) and the other fills Dr. Alex Ophir's vacancy. We are also interviewing for a new position to address departmental growth. As enrollment grows we are continuing to work and focus on financial assistance, such as scholarships and fellowships, for our students. Zoology has a terrific alumni base and we hope to add more student scholarships named in their honor or for an individual of distinction. For example, as many of you know we just completed the endowment named in honor of Dr. Bryan Glass and a student will receive the first fellowship in Spring 2014. If you are interested in discussing the potential of an endowment please drop me an email or give me a call. Finally, many of you have asked about the reorganization of the Life Sciences mentioned in last Fall's *Alumnidae*. We have little to report except that those discussions are continuing above the departmental level.

Faculty Highlights

Dr. Sarah DuRant (left) joins the Department of Zoology as an Assistant Professor. Sarah received her Master's in 2006 and Ph.D. in 2011 from Virginia Tech. Prior to joining the faculty at Oklahoma State she was a postdoctoral fellow at Tufts University. Sarah's research has focused on the influence of environmental stimuli on physiological traits that have implications for fitness. Her early career focused on the sub-lethal effects of contaminants (e.g., heavy metals, acetylcholinesterase-inhibiting pesticides) on reproduction, locomotor performance, and energy expenditure in amphibians and reptiles. More recently, her research has shifted to parental effects, understanding how the developmental environment shapes offspring phenotype and its implications for parent and offspring fitness. Sarah's research also explores interactions between stress and immune processes. Sarah brings with her a Ph.D. student, Ashley Love, who will examine the influence of parental disease exposure on offspring phenotype in birds.

Dr. Polly Campbell (right) recently joined the Department of Zoology as an Assistant Professor. Polly received her Ph.D. from Boston University in 2006. She did her first postdoc at University of Florida, funded by an NIH Ruth L. Kirschstein NRSA fellowship, and a second postdoc at University of Arizona, funded by a G. G. Simpson Postdoctoral Fellowship. Polly is an evolutionary geneticist with strong interests in speciation and reproductive behavior. She currently uses crosses between house mice subspecies and their wild relatives to study 1) the genetics of premating isolation, and 2) the effects of hybridization on behavior and neural gene expression.

We welcome Sarah and Polly as well as Polly's husband Giorgio to Stillwater.

Zoology team receives NSF funding to study lizards

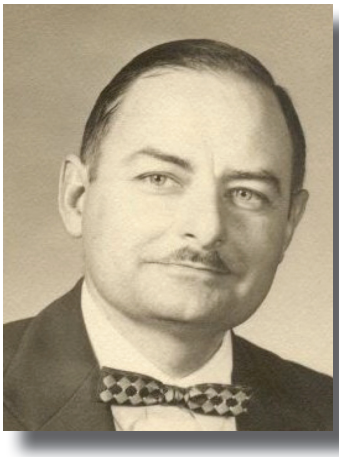
Department of Zoology members, **Stan Fox** (Emeritus Faculty), **Jennifer Grindstaff**, **Matt Lovern**, and **Ron Van Den Bussche** were recently awarded a $500,000 grant from the National Science Foundation to study the development of sexual selection in collared lizards. In many animal species, males and females are different in appearance and behavior and these differences usually arise about the time of puberty, when hormone changes occur. These researchers will use a population of collared lizards at Sooner Lake (north of Stillwater) to explore the possibility that these sexual differences could develop earlier in life as long as the advantages of the differences are expressed later, as adults, in gaining mates. To date very few studies have investigated this early, pre-reproductive expression of sexual differences (and the later advantages). In one case, hatchling male collared lizards that are establishing their territories develop bright orange bars on their sides and treat other hatchling males aggressively but treat hatchling females non-aggressively. These young males begin to pair bond with young females as future mates and repel young males as future mate rivals. The funded research will use biochemical, genetic, molecular, and field experimental approaches to document the hormones responsible for the development of the early sexual differences in this species, and the genetic advantages expressed later in life. Possible costs associated with increased conspicuousness and potential negative effects on immune function will also be measured. This species is a model for the study of this phenomenon, and results could apply broadly, even to humans. The research should spur more investigation of early sexual differentiation and plant a paradigm shift in evolutionary ecology, as precocial sexual selection.

Puni Jeyasingh receives prestigious grant

Dr. Puni Jeyasingh was recently awarded funding of $439,041 from the National Science Foundation for a three year grant that will focus on whether predictions of evolutionary shifts in physiology of animal populations can be based on historical changes in the environment. In collaboration with Drs. Larry Weider at the University of Oklahoma, and Mark Edlund at the Science Museum of Minnesota, Dr. Jeyasingh will study the precise mechanisms that underlie observed evolutionary shifts coinciding with changes in key environmental parameters such as phosphorus loading history (nutrient enrichment that affects water quality). They will use a unique model organism, *Daphnia*, a small crustacean that lives in lakes and produces resting eggs that can lay dormant in sediments for centuries. In previous studies these researchers have been able to directly observe the consequences of man-made change in a natural population using this organism. Specifically, they will use cutting-edge paleolimnological tools to examine lake-bottom sediments to reconstruct environments reflective of pre- and post-European settlement in a Minnesota lake, and use that information to test the performance of ancient and extant *Daphnia* genotypes to assess anthropogenic impacts. Furthermore, they will identify the genes that underlie such evolutionary shifts. The performance of these genes in predicting responses to nutrient enrichment (eutrophication) in a different lake will also be assessed. Answers to such questions should foster better forecasting models of global environmental change and inform effective management.

Nicole Biddinger, a senior from Bartlesville High School, interned in Dr. Puni Jeyasingh's lab during the summer of 2012 conducting experiments to understand thermal tolerance in ancient and extant *Daphnia* genotypes that were resurrected from resting eggs in lake sediments. Working closely with OSU-Zoology senior, Rosa Yorks, Nicole found that ancient genotypes were more sensitive to thermal stress compared to more recent genotypes. In March, Nicole was awarded a $1,500 scholarship to represent the mid-west region at the National Junior Science and Humanities Symposium (Dayton, OH). In the first week of May, Nicole competed against students from across the continental US, and Puerto Rico and won first place, which included a $12,000 award.

Brian P. Glass Fund fully endowed



Thanks to the generous responses of an anonymous donor, former students, Zoology faculty, and family members, the ***Bryan P. Glass Student Scholarship/Fellowship in Zoology Fund*** passed the critical $25,000 mark in November 2013. The fund was initiated in August 2012 through a gift from Dr. Glass's former student Geneva Murray. Dr. Glass was a faculty member in the Department of Zoology for approximately 40 years and served as Curator of Vertebrates. His efforts brought the Collection of Vertebrates to international attention, and it continues to provide irreplaceable materials for research and teaching at OSU. Now that the Glass Fund is fully endowed, a scholarship/fellowship will be provided each year to one or more students enrolled in the Department of Zoology and incorporating experience with the OSU Collection of Vertebrates as part of their academic experience. The first Glass Fund Award will be presented at the Department's Annual Banquet in March 2014.

Graduate and Undergraduate Student Highlights

Zoology graduate students shine in inaugural 3MT competition

In June the OSU Graduate College held the inaugural **3MT – Three Minute Thesis Competition**. Ten finalists were selected from over 40 OSU graduate student entries and competed for $2,500 in cash prizes. Two of the ten finalists were from the Zoology Department. This research communication competition provides graduate students an opportunity to hone their presentation, communication, and engagement skills by presenting a compelling oration on their dissertation/thesis research and its significance in just 3 minutes. And, if that is not challenging enough they must use language appropriate to a non-specialist audience. **Ms. Medhavi Ambardar** from Dollar Bay, Michigan was the second place award winner. Medhavi, advised by **Dr. Jennifer Grindstaff**, presented her dissertation work on how hormones mediate trade-offs associated with parental care and the fitness implications of these trade-offs in bluebirds. **Mr. Shaun McCoshum** from Las Vegas, Nevada was awarded third place. Shaun is advised by **Dr. Kristen Baum** and presented his dissertation work on the impacts of canola production on insect pollinators and wild plants.

2013-2014 Niblack Scholars include three from Zoology Department

Three undergraduate students associated with the Zoology Department received Niblack Scholarships to conduct original research at Oklahoma State University. Funding for the scholarships was established by Dr. John Niblack, former Pfizer Vice Chairman, who credits his exposure to undergraduate reseach experiences at OSU as instrumental in his career choice in research. Fifteen scholars were selected this year and each student receives an $8,000 scholarship and will work under the guidance of a faculty sponsor and a graduate student mentor. Our three scholars include:

Sydnee Homeyer - a physiology major who worked as a Freshman Research Scholar (2012-2013) with **Dr. Jennifer Shaw**. Sydnee will continue her research on the role of oxidative stress on communication within the coronary blood vessel wall via gap junctions.

Ashley Graupman - a zoology major whose Niblack project is an outgrowth of a Honor's Contract she completed for ZOOL4174 Mammalogy. She will work with **Dr. Karen McBee** and graduate student **Rachel Eguren** in comparing bone density and bone compression strength in bats exposed to lead, zinc, and cadmium at Tar Creek Superfund Site and in bats from reference sites.

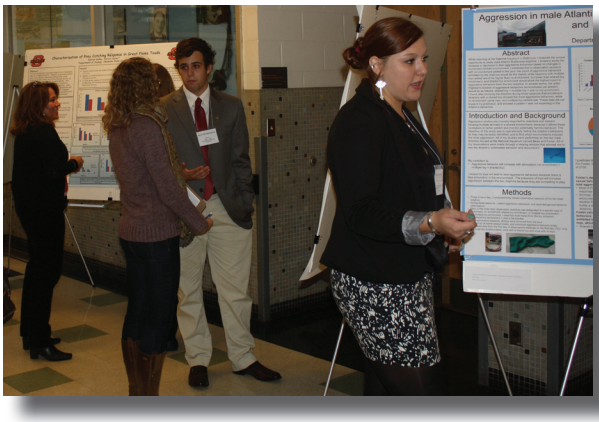
Cierra Keith - a biology major has worked in **Dr. Michael Tobler's** lab since 2012 as a Freshman Research Scholar. Her current project includes studies of metabolic physiology in livebearing fishes as well as studying plastic and genetic components of variation in phenotypic traits. Cierra recently presented some of her research at the 3rd Karen L. Smith Symposium.

Graduate student receives Ford Foundation Fellowship

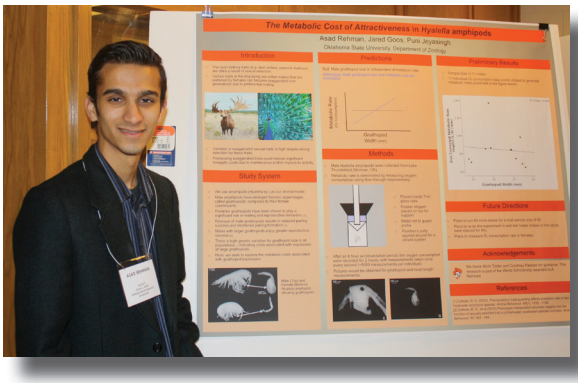
Megan Trope, a member of the Choctaw Tribe and a Ph.D. student in **Dr. Ron Van Den Bussche's** laboratory has received a prestigious Ford Foundation Fellowship. Besides Megan, currently OSU has only one other Ford Foundation Fellow. This Fellowship Program, offered through the National Academy of Sciences, seeks to increase faculty diversity at U.S. colleges and universities. Receiving this 3 year fellowship will allow Megan considerably more time to conduct her dissertation research "Conservation Genomics of Bald Eagles."

Mark your calendars: The 2014 Zoology Awards Banquet will be held on 28March 2014, 6 to 9 pm. The venue is once again Click Hall in the Conoco Phillips Alumni Center. We will send out additional information as the date approaches. Hope to see you there.

Third Karen L. Smith Undergraduate Research Symposium

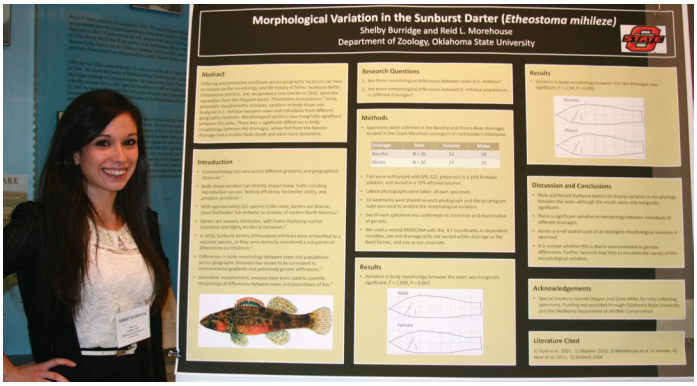


Students and faculty participated in the third Karen L. Smith Undergraduate Research Symposium on 22 November 2013. Left to right - Allyn Evans, Sarah DuRant, Baylor Fingerlin, and Bailey Franklin.



Asad Rehman presented his project on the metabolic cost of attractiveness in amphipods.

Victoria Hanna presented her work on insect population size and lead contamination levels at Tar Creek Superfund Site.



Shelby Burridge presented her work on morphological variation in the sunburst darter.

The Karen L. Smith Memorial Undergraduate Research Symposium Endowment was established in November 2013 in recognition of Karen's exceptional service to undergraduates at Oklahoma State University. The Fund supports costs associated with the Symposium, which is held near the end of every Fall and Spring semester and includes the Karen L. Smith Research Excellence Award for the best student presentation. The current fund balance is $6,000 and will be fully endowed when charitable contributions reach $25,000. If you would like to help us build this endowment see the form on page 6 of this newsletter.

The Alumnidae

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We hope you enjoy The Alumnidae, and we hope to hear from you about future issues. To be sure that you continue to receive the newsletter, please update address and email information with the OSU Alumni Association at:

http://www.orangeconnection.org

If you have comments, questions, or contributions for The Alumnidae send them directly to meredith.hamilton@okstate.edu

YES! I want to support the ZOOLOGY DEPARTMENT at Oklahoma State University!

1. DESIGNATION

❑ Zoology Excellence Fund (223750)
❑ Wilhm Teaching Assistant Award (228230)
❑ Wilhm Graduate Student Travel Award (228235)
❑ Scholarship for Zoology Students (224550)
❑ Burks Student Award (223590)
❑ Herbert and Betty Bruneau Zoology Seminar Fund (229873)
❑ Dr. Michael Steelman Scholarship (229830)
❑ Bryan P. Glass Scholarship/Fellowship (229893)
❑ Chappabitty Scholarship (228855)
❑ Collection of Vertebrates
❑ Bob and Julia Bollinger Field Research Grant (228860)
❑ Karen L. Smith Undergraduate Research Symposium Fund (2298530)

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