



BioMass
Biology Student Newsletter

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BIOMASS COORDINATOR: KIRSTEN SLETTEN '16

IN THIS ISSUE:

Introducing Assistant Professor Sarah Amugongo

by Kirsten Sletten '16



The biology department is pleased to welcome Professor Sarah Amugongo to the St. Olaf faculty!

Originally from Kenya, Professor Amugongo completed her undergraduate studies in Botany, Zoology, and Education. She then went on to a PhD program in Integrative Biology at the University of California Berkeley. Her research focused on Skeletal Physiology. Thereafter she completed Postdoctoral training at the University of California Davis. After completing her education she went back to Kenya where she taught undergraduate and graduate students at two different institutions.

During initial plans to attend medical school, Amugongo discovered her interest and passion for human physiology. She decided to switch trajectories and pursue a career in

teaching and research. This fall and spring Professor Amugongo will be teaching Anatomy and Physiology, a course she has past experience in teaching. As a professor she enjoys "interacting with students, being in front of the class teaching and seeing the way students reason and get that ah-ha moment". It motivates her to see young people move towards their dream and know that she is playing a role in guiding them towards achieving their goals.

Professor Amugongo's research focuses on the role of prenatal exposures on adult body composition. She is excited to continue her research at St. Olaf College. Current plans are for her lab to be up and running by summer where students will be able to assist her in researching the effects of *in-utero* alcohol exposure on bone development in rats, which she will be using as animal models. Amugongo plans to involve students on every step in the research process, including literature review and designing of the experiment. (go to pg 4)



Can hunters and conservationists coexist?

Your Student Naturalist Article for this issue written by Karly Boll '16

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Biology in South India

Lisa Koetke '16 while in India last fall. Photo credit to Tiffany Eisenbach '16.

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Student Naturalist Article

Can hunters and conservationists coexist?

By Karly Boll '16

As we begin November, we all know someone who will be suiting up in blaze orange and camo and braving Minnesota's chilly early mornings in hopes of bringing home an impressive buck. Love it or hate it, the reality is that hunting is a big part of Minnesotan culture. Being the environmentally conscious Oles that we are, the question begs to be asked: Is hunting good or bad for the environment? The answer will depend on who you ask, and it probably isn't a yes/no answer. However, the least we can do is educate ourselves on the regulations that Minnesota puts in place and on the overall environmental impact of the sport.

Let's talk about white-tailed deer, the most popular large game animal in Minnesota. White-tailed deer in Minnesota were quite rare until agricultural practices cleared out much of our native forests and created the open spaces that deer prefer, and now their numbers hover around 1 million (almost one deer per five Minnesotans!). This number is so high it poses a threat to the environment. Deer feed on



white-tailed deer buck, [Wikipedia.org](https://en.wikipedia.org/wiki/White-tailed_deer). 1

specific plants, shifting subcanopy composition and compromising forest integrity. In some areas of the US, it is predicted that some of these effects are so intense that certain plant species may not be able to recolonize on their own, even if deer populations were under control. One approach taken to control these numbers is hunting.

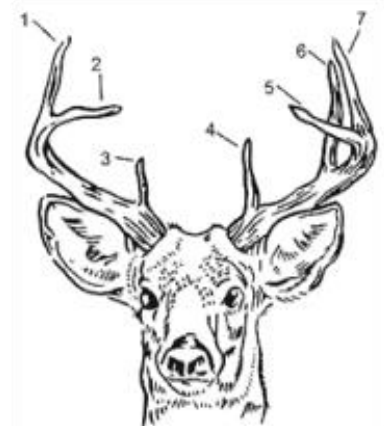
It is important to note that there is a seemingly endless amount of constantly changing regulations on hunting, all to keep hunting safe and sustainable. On the MN DNR website, there is a 132-page handbook on all of the rules, and here are just a few. Minnesota sticks to strict hunting seasons and zones which are distinct for different animals. These rules attempt to restrict hunting to times that will manage the population in the best way

possible for a given year. For example, statewide deer season* this year is November 7th-22nd, a relatively short time especially considering most hunters only go out on weekends.

In addition to this, there are strict regulations on how many and what kind of

deer you can shoot. After receiving your hunting license, you receive a certain amount of tags**, AKA; the maximum number of deer you can kill in a season. However, a hunter may only tag one legal buck (a male deer

that has 4 or more points per antler) any given year. During bumper years (when populations are high), hunting of antlerless deer (females) is encouraged to



How to count points on a buck, University of Missouri 2011.

reduce fawn births. Since most hunters would prefer bagging an impressive buck, many states employ an "earn-a-buck" policy that requires the killing of an antlerless deer before being allowed to kill a buck. In conservative years, when the population is lower and is given the chance to rejuvenate (like this year), more tags are handed out for bucks in the hopes of increasing fawn populations in the upcoming year. While you may still oppose hunting for a variety of reasons, at least know that Minnesota takes its hunting, and more importantly its nature, quite seriously.

(concluded on pg 4)

Interim Offerings in Biology 2016

On Campus:

Bio 124: The Biology of Women – Professor Fruehling

Issues of women's biology including views of the evolving female and biological determinism are examined. Core material covers anatomy, development, the biological basis of gender, reproduction, sexual response, the menstrual cycle and aging, and aspects of women's health such as eating disorders, cancers, and hormonal treatments.

Bio 135: Thinking and Doing Bio – Professor Giannini

Why do biologists do what they do? How is biology actually done? Students investigate the reasons biological science is done the way it is today. Students have the opportunity to design and perform their own experiments while learning the process of scientific investigation.

Bio 248: Invertebrate Biology – Professor Mohl

This course traces the path of invertebrate evolution from single-celled protozoans to the most primitive chordates. Emphasis is placed upon major breakthroughs in design that enable organisms to exploit new ecological habitats. Laboratories are designed to introduce students to the major invertebrate groups via observation of living animals and through dissection.

Bio 249: Probing Life with Light: Professor Cole

A range of microscopic techniques including brightfield, darkfield, interference, fluorescence, and advanced techniques including laser confocal microscopy are covered in this course. In parallel to microscope training sessions, students learn the latest computer techniques for video image grabbing and analysis.

Bio 386: Animal Behavior – Professor Son

This course approaches the study of animal behavior from the blended viewpoints of evolutionary behavioral ecology and comparative psychology. Mechanisms of learning, cognition and development, as well as aggression, territoriality, and mating are examined at the organismic and cellular level.

Off Campus:

Field Paleontology – Professor Freedberg

This course explores the natural history of our planet through the fossil record. Students learn from professional paleontologists and museum curators about how fossils are used in scientific research prior to embarking on a 10-day vertebrate fossil expedition in central Florida. The students then curate, catalog and interpret their data, using a large museum reference collection.

Peruvian Medical Experience – Professor Demas

This course is a service/learning experience. Week one is spent on campus learning basic clinical techniques, examining emerging disease, and studying existing health care issues. Students spend three weeks in Cuzco, Peru, assessing patient needs in a public hospital, a homeless shelter, orphanages, and a small village.

Equatorial Biology – Professor Walter

This course offers intensive field-biology experiences within three equatorial New World environments: the Amazon rainforest, the Andes cloud forests, and the Galapagos Islands. Students compare the rich biodiversity, the adaptations and natural history of species, and the influence of human impact on these areas.

Spend the chilly month of January in the warm walls of Regents or off campus this upcoming interim by taking one of the many courses offered by the biology department. It's a great time to huddle down with a cup of hot chocolate and study biology!



Left to right: Britta Larson '16, Ginny Larsen '16, and Bailey Kent '16 Photo Credit: Ginny Larsen

Amugongo Introduction Continued from pg 1

When she isn't teaching Professor Amugongo is busy discovering the wonderful nature trails Northfield has to offer, along with watching movies, spending time with family and traveling. She is looking forward to experiencing her first winter and taking advantage of Minnesota's snowy conditions to try skiing.

These days finding time to travel is difficult, but Professor Amugongo hopes to plan and lead a course with students to East Africa to study healthcare from an anthropological perspective. Professor Amugongo has exciting plans for her time at St. Olaf that will offer students many opportunities and experiences.

Can hunters and conservationists

coexist? Continued from pg 2

*Firearm season specifically, there's different seasons for different weapons such as archery or muzzleloader season. These specialty seasons are generally longer because the success rates are much lower.

**This year the tag limit is only one deer (with a few exceptions), as it is a restrictive harvest year to allow populations to rebuild

Resources

MNDNR: Deer Management. 2015. Minnesota Department of Natural Resources. <http://dnr.state.mn.us/mammals/deer/mgmt.html>

MNDNR: Minnesota Hunting and Trapping Regulations Handbook. 2015. Minnesota Department of Natural Resources. http://files.dnr.state.mn.us/rlp/regulations/hunting/2015/full_regs.pdf#view=fit&pagemode=bookmarks

Pursell, D., Weldy, T., and M. White. 2013 Too many deer: A bigger threat to eastern forests than climate change? In Cool Green Science. The Nature Conservancy. <http://blog.nature.org/science/2013/08/22/too-many-deer/>

Biology in South India

By: Kristy Rudberg '16, Lisa Koetke '16, Ruth Whittington '16

The Biology in South India program provides wonderful opportunities for undergraduates to conduct two research projects in biology, ranging from ecology to public health. The student works with site advisors to develop and carry out research that both interests the student and benefits the site. In 2014, students chose to conduct research in genetics, soil and water quality, animal behavior, social behavior, biodiversity, parasites, and plant

regeneration. Not only do students learn about the theories and methods of research, they are also encouraged to engage with the local rural communities of South India. (continued on pg 5)



"I had the amazing opportunity to research social behavior towards cervical cancer at RUHSA (Rural Unit for Health and Social Affairs). I partnered with the director of RUHSA, a doctor who has dedicated her life to, among other things, combating cervical cancer. My research was conducted through interviews with a translator in the field. Even with the sensitive nature of the subject, I was treated with the utmost respect and hospitality, including constant offers of chai! In the end, I determined that the social stigma surrounding cervical cancer was the main deterrent for earlier detection and treatment. RUHSA can use my findings to improve education methods. As for me, my time spent interviewing the women opened my eyes, not only to my passion for public health, but also to the complex social dynamics surrounding a stigmatized cancer."

Kristy Rudberg '16 Biology Major

Biology in South India (continued from pg 4)

“Both of my research projects were focused on the ecology of wildlife. For one project, I had the privilege of working with Dr. Raman Sukumar of the Indian Institute of Science to study the behavior of chital, a native species of deer. Through field observations of deer behavior near Mudumalai Wildlife Sanctuary, I determined the effects of group composition on deer vigilance, one of the main anti-predator defenses of prey species. I learned how to work in an international team and how to plan, conduct, and analyze a large research project. I also was lucky enough to live and engage with doctorate students in my field of interest, which sparked my interest in research as a career. The opportunity to conduct international biology research as an undergraduate student was invaluable to the development of my career goals while my time in India gave me a broader global perspective by introducing me to a different culture, religion, and environment.”

Lisa Koetke '16 Biology Major, Environmental Studies Concentration (pictured right)



“Before going to India, I had little idea of what life after college would look like. With a vague interest in plant biology, I headed to South India hoping to broaden my perspective. For my first research project, I was centered in Kodaikanal, a town in the middle hills of the Western Ghats. Here, we collaborated with Palni Hills Conservation Council, an organization which coordinates many habitat conservation and sustainable development projects in the larger Palni Hills area. The projects range from energy producing toilets to water quality assessments. My project focused on the water filtration potential of wetland plants, involving chemical tests to determine levels of nitrates, phosphate, and other chemicals in the water before and after wetlands. Through this research, I gained a better understanding of how research can affect conservation efforts and enact change. PHCC was a really inspiring organization to work with and helped me understand how to conduct research in the “real world”. After this project, I realized my interest in the use of ecological research to protect and conserve the environment, a subject which I have focused on since returning to classes at St. Olaf and which I hope to utilize in my future.”

Ruth Whittington '16 Biology and Religion Major (Photo credits to Tiffany Eisenbach '16)

Students on the Biology in South India program are given the amazing opportunity for both intensive undergraduate research and cultural engagement. The first month of the program is spent at the Inter-Church Service Association (ICSA) in Chennai for orientation lectures from local specialists on a variety of topics, ranging from politics to ecology to gender studies. We learn not only about the history and current events of India, but also how to live in a city in India. The students then move to the Christian Council for Rural Development and Research (CCOORR) for a week of rural orientation before heading to their first research site. This global perspective gained in and near Chennai is furthered over a two week long travel break planned by the students during which they have the chance to travel to Northern India. Overall, the Biology in South India program provides students with an opportunity for academic and experiential education and enhances their global perspective.