



Elizabethtown College

# Biology Newsletter

Fall 2013

## 2013 Biology Alumni Award Winner



Dr. Tom Murray, Martha Farver-Apgar and Mr. William Maichle

At our Annual Awards Banquet in April the Department of Biology presented Mr. William R. Maichle the Dr. Charles S. Farver-Apgar and Dr. Bessie D. Apgar Biology Alumni Award. Billy came to Elizabethtown from Wilmington, Delaware with an interest in Psychology before entering the Biology Department. He graduated in 2000 with a major in Biology and a minor in Psychology.

After graduation, he worked as a research associate at Wake Forest University and then held several positions supervising clinical trials. He served as Director of the Virtual/Specialty Pharma Business Unit at PharmaNet. From there he became Senior VP for Drug Development at Pro Ethic Pharmaceuticals. In

2007 he became COO of Kowa Pharmaceuticals Inc., overseeing their operations throughout North America. He joined Nautilus Neurosciences in 2010 as COO and now serves as CEO having launched their lead product, Cambia and raised over \$50 million in private equity capital.

During Billy's visit to campus he met with students and gave a presentation entitled *The Changing Landscape of the U.S. Pharmaceutical Industry: Opportunities and Challenges in 2013 and Beyond*. He is an accomplished pharmaceutical industry executive with extensive experience in drug development, mergers & acquisitions, licensing, sales & marketing, and commercial operations.

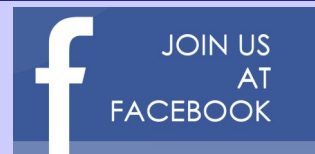
### 2013 Homecoming News

#### Department of Biology Alumni Reunion

3:30 p.m. in the Masters Center Atrium  
Saturday, October 19th

**We Hope You Can Join Us!**

Let us know your are coming by  
Joining the Event on our Facebook Page



**This will be our last printed newsletter**

Keep up with us on [Facebook](#) by **Liking** our page and subscribing to our **Notifications**. Please **Post** information about your career and family, so we can all stay connected and don't forget to **Join** any Biology Department **Events** that you plan to attend.

## From the Chair.....



Greetings Alumni!

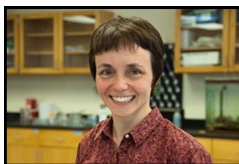
I am pleased to announce that I have been coaxed out of my laboratory into the Chairman's office. As the new Chair of the Biology Department, I hope I can live up to the expectations of everyone - past, present and future! I joined the department in 1993 quickly followed by Dr. Murray who arrived in 1994 (we are now the old-timers). I find it hard to believe that 20 years of students have come and gone; yet, the first years' pinning ceremonies and the Dell graduations are still as exciting as my first year here. Some things, hopefully, will never change, however, the face of the department is looking a little younger to me these days. Congratulations to Dr. Jodi Yorty who was tenured and promoted to the rank of Associate Professor last year. Dr. Yorty replaced Dr. Polanowski, and has done a wonderful job filling his shoes teaching Immunology and Molecular Biology. She also developed a Nutrition class and has an active research program that you can read more about below. Dr. Bowne joined us in 2008 replacing Professor Laughlin and has developed new courses in Geographic Information Systems & Conservation Biology. Dr. Aaron Cecala, our Anatomy and Physiology professor who replaced Dr. Dively, is already in his fourth year and has developed a new class, Cognitive Neuroscience, which complements the new Cognitive Science Minor for which he is the advisor. Lastly, we are pleased to announce the addition of a three-year Visiting Assistant Professor, Dr. Anya Goldina. Dr. Goldina comes to us from Florida International University and will be teaching the Human Anatomy & Physiology sections. Her research will be a great addition to the department adding Behavioral Endocrinology to our mix.

The last "new face" will be our Facebook page. We are hoping you will all join our [Elizabethtown College Biology Department page on Facebook](#) and set us to receive notifications. We are excited to keep connected with you as efficiently as possible, share great classmate stories, keep up on current faculty and student achievements, and of course keep us posted on your latest achievements. With Homecoming just around the corner join us and let us know if you are coming on October 19<sup>th</sup>. We hope to see you, especially at our Alumni Reunion Reception at 3:30 pm in the Masters Center Atrium.

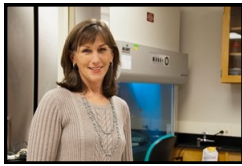
## Faculty News



**Dr. David Bowne** and Alexandra Doran '15, along with seventeen co-authors, presented the first-year results of "TurtlePop," a national project researching the impacts of urbanization on freshwater turtle populations at the Ecological Society of America national conference in Minneapolis, Minnesota. Dr. Bowne, Aleah Miller '13, and colleagues presented their research on the effects of legacy sediment on bog turtles at the International Congress for Conservation Biology in Baltimore, Maryland. Alexandra Doran '15 and Ryan Conway '15 participated in the Summer Scholarship, Creative Arts and Research Program (SCARP) with Dr. Bowne in investigating how salamanders and frogs are responding to an aquatic restoration project at Big Spring Run, Lancaster County. Dr. Bowne also collaborated with Dr. Matt Skillen, English, in developing a new course that combines the teaching of ecology and creative writing.



**Dr. Diane Bridge** conducted research together with students Ryan Welker '14, Craig Hunsberger '15, and Kendall Cliatt '15 using the simple invertebrate *Hydra* as a model to understand diseases of aging. This work is being conducted in collaboration with Dr. Daniel Martinez of Pomona College in California and is funded by a grant from the National Institutes of Health. The goal of the research is to determine the molecular causes of the difference between a species of *Hydra* which appears to be immortal and a species that shows physical deterioration with age, as well as unusual sensitivity to heat. Dr. Bridge and her students presented results from this project at the Disappearing Boundaries Summer Research Meeting at Lebanon Valley College in July.



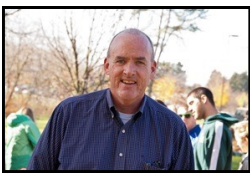
**Dr. Jane Cavender** continued research with students, Kyle Lord '13 and Sarah Sulon '14. Kyle's work is very close to publication and involves the activities of SV40 T antigen that are necessary to trans activate the cyclin A and E promoters. Sarah worked this summer in the lab as part of the Summer Scholarship, Creative Arts and Research Program (SCARP) investigating her hypothesis that SV40 T antigen binds to the cytoplasmic Cul-7 protein and transports it to the nucleus to re-direct its functions.



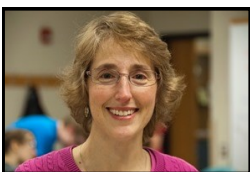
**Dr. Aaron Cecala** completed a series of human eye movement experiments with the help of three Biology recent graduates (Brittany Benjamin '13, Alisha Martin '13, Chris Macomb '13). This student coauthored work has been submitted for peer-review in the undergraduate research journal *BIOS*. He will be continuing this vein of research with Madison Brown '14, Matthew Zdradzinski '14, and Leticia Martins '16 during the current academic year. Over the course of the past year Dr. Cecala was appointed as a visiting scholar in the Department of Otolaryngology at the University of Pittsburgh, was invited to discuss his work in the Animal Behavior Colloquium series at Millersville University, had a book review accepted for publication in the *Journal of Undergraduate Neuroscience Education*, and has another manuscript under review in *Advances in Physiological Education*. He is also the Director of the Interdisciplinary Cognitive Science minor and was recently named Chair of the Health Professions Advisory Committee.



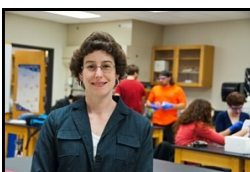
**Dr. Jon Coren** spent the summer traveling for pleasure in Peru and Bolivia for three weeks and in Turkey for ten days. He also presented a poster at the Human Genetics and Genomics Gordon Conference at Bryant University in Smithfield, Rhode Island and was the chair of Track 4: Applications of Proteomics and gave an oral presentation during this session.



**Dr. Tom Murray** and his students are currently working on three projects. In the first, Lauren Breza '14, Abby Steele '14 and Hannah Brubach '14 are conducting a biological assessment down the main stem of the Conewago Creek as part of the Conewago Initiative. They hope to be able to document improvements in the Creek as more and more Best Management Practices come on line in the Conewago watershed. Secondly, the restoration of Lake Placida has provided the opportunity for Brandon Costik '14 and Jeff Royer '14 to monitor the nutrient dynamics in the lake as native plant and fish species become established this fall. The plan is to present the findings from both projects at upcoming meetings in the spring. Lastly, all five students will be assisting in analyzing data from the Riparian Buffers Affect Stream Temperature (RBAST) project. The RBAST project is examining the impact of riparian buffers at 12 stream sites in the US and Canada. The work was presented at the Ecological Society of America meeting in 2012 and a manuscript from the first year of the project is in review. The students will be analyzing the second year's data from a small stream outside Elizabethtown where sensors record changes in temperature in both forested and open reaches.



**Dr. Debra Wohl** Gates Failing '16, Jessica Albrecht '15 and Dylan Carmichael '15 have been busy this year learning some new approaches and techniques to study microbial interactions associated with built environments. They are particularly interested in how microbial communities respond to spatial and temporal variation. Dr. Wohl and Taylor Olian '14 are working with Dr. Bowne's lab to look at changes in land use and incidence of asthma. Dr. Wohl's study of birthing practices and the development of asthma, eczema, and allergies in young children is almost complete. In March, "Effects of antibiotic exposure and immune system challenge on the development of allergic asthma" by Kaitlyn Tyrie '11, Wohl and Curry was published in *Bios*.



**Dr. Jodi Yorty** received tenure and was promoted to Associate Professor of Biology this past year. She continues her research examining the effects of stress on the immune system, and is beginning studies quantifying various subsets of dendritic cells in mice exposed to corticosterone. Dr. Yorty had a manuscript published in *Brain, Behavior, and Immunity*, and a second manuscript with coauthor Elizabeth Bahr '12 is in press in *Bios*. Dr. Yorty traveled with 15 students to Vietnam for the third time this past May. Excitingly, she is currently developing a May-term trip to Ghana during which biology students interested in health care will shadow physicians in a village hospital.

## We Welcome New Faculty



*Dr. Anya Goldina*

**Dr. Anya Goldina** joins the Biology Department as a Visiting Assistant Professor. Dr. Goldina received her Ph.D. from Florida International University where she studied how hormones regulate communication signals of weakly electric fish. Her broad research interests include animal behavior, endocrinology, and social neuroscience. Dr. Goldina is particularly interested in understanding how social behavior is regulated by hormones, and how hormones help shape future behavior of an individual. At Elizabethtown Dr. Goldina will use crayfish to examine the endocrine mechanisms by which social environment and experience modify behavior. In the future, she hopes to incorporate electric fish into her research program.

Dr. Goldina taught the introductory course Biological Concepts and is teaching Human Anatomy and Physiology.

## Summer 2013 Student Research Activity with Faculty

Eight students performed research and worked with faculty this summer at the College. Their research was supported by Dr. Bridge's grant from the National Institutes of Health, and a new program initiated by the college, the Summer Scholarship, Creative Arts and Research Program (SCARP). This program has been created to support independent student research under the sponsorship of a faculty mentor. The program is a non-credit experiential learning program designed to enhance professional skills and provide a competitive advantage to participating students in the pursuit of career opportunities and graduate studies. At the same time, participating faculty scholars and researchers benefit from student involvement in support of professional scholarship and research agendas. Students involved in this program share their experiences below.



*Alexandra Doran and Dr. Bowne using a kicknet to find salamanders in a restored wetland*

**Alexandra Doran '16 and Ryan Conway '16**—This summer we assisted Dr. David Bowne with his fieldwork at Big Spring Run in Lancaster, Pennsylvania. We assessed the presence of salamanders in a post restoration wetland setting, using three different capture methods. The data we collected contributed to Dr. Bowne's study on how salamanders are responding to the method of restoration used at Big Spring Run. We also worked with Dr. Bowne on his "TurtlePop" project with EREN. The project spans the majority of the East Coast and into the Midwest, resulting in a large amount of data to process. We used ArcGIS software to analyze the land use around the areas Dr. Bowne's colleagues were studying to help discern if any correlation between land use and turtle population size and gender make up is present.

**Jessica Albrecht '15 and Gates Failing '16**—This summer we worked with Dr. Wohl exploring the techniques and procedures necessary to examine microorganisms of indoor environments. Over the span of four weeks, we were able to use and capture images of DAPI stained bacteria, count cells and convert that number into a known concentration, perform PCR, and visualize DNA on an agarose gel. DAPI is a fluorescent stain that binds to DNA, and when visualized under a fluorescent bulb, the cells can be viewed and counted as bright blue. PCR was performed to isolate the 16S rRNA gene inside the bacteria. This gene is frequently used to determine the diversity of microbes of an area and to examine phylogenetic relationships. The agarose gels were used to confirm the PCR reactions were successful. All of these tools will be used in our future studies to explore the role and function of the indoor micro biome.

## More Summer 2013 Student Research Activity with Faculty

**Sarah Sulon '14**—This past summer I worked in Dr. Cavender's lab at Elizabethtown College on a grant proposal that I wrote during the spring semester. The goal was to determine the localization of the endogenous Cullin 7 (Cul7) protein when bound to the SV40 viral protein T-Antigen (T-Ag). SV40 is an oncogenic virus in rodents and is often used as a model to study the progression of viral cancers in humans, such as the HPV. The formation Cul7/T-Ag complex has been found to contribute to the progression of cancer in cells, though its localization remains unknown. Thus this summer, I worked on identifying the location of the complex in order to gain a deeper understanding of its role in cancer development. Though issues with detecting Cul7 prevented me from completing my planned experiment, significant progress was made in establishing cell lines that express different mutant forms of T-Ag in Mouse Embryonic Fibroblast (MEF). My research continues into the semester, where I hope to troubleshoot the detection method of Cullin7 in order to perform my localization experiment. Overall, this summer was an enriching opportunity in which I gained confidence and critical thinking skills in the lab setting. Though days in the lab could be long, I could focus entirely on my project for the 9 weeks I spent at Elizabethtown College. This provided me with an experience similar to what researchers in the field commit their working lives to. It was also fun spending the majority of my summer on campus with close friends while not having to worry about homework or exams after my hours in the lab were complete.

**Kendall Cliatt '15, Craig Hunsberger '14 and Ryan Welker '14**—These students worked in Dr. Bridge's lab at Elizabethtown College. Ryan Welker worked on a nine-week long project asking whether the ability to effectively respond to stress by producing heat shock protein 70 decreases with age in *Hydra oligactis*. Craig Hunsberger's research addressed whether small heat proteins are expressed in stem cells of aging and non-aging *Hydra*. Kendall Cliatt's research focused on the expression of molecules of the insulin signaling pathway in aging *Hydra*. Kendall spent evenings with friends studying for the MCAT exam.

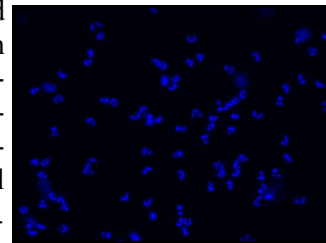
## Student Summer Experiences

Many of our students spend the summer in other research laboratories, pursuing internships, gaining experience “on the job” and volunteering in biology-related fields. Here are some personal accounts of what our students learn and experience from these opportunities. If you have openings for students, please let us know.



Ceyda in front of the Goldenston Biomedical Research Building

**Ceyda Sablak '15**—This summer I had the amazing opportunity to complete two internships. As a German minor, I obtained a pre-med related internship in Frankfurt, Germany where I worked at a hospital. In the mornings I shadowed doctors and attended their classes and rounds, and in the afternoons I was able to spend time with patients and practice German with them. My second internship was at Children's Hospital of Boston in cooperation with the Immune Disease Institute. There, I performed research in the Remold lab trying to determine whether protein SerpinB1 was located in the nucleus or the cytoplasm of neutrophils (a type of white blood cell). SerpinB1 inhibits neutrophil elastase, among other serine proteases, preventing neutrophils from dying. When neutrophils die they form neutrophil extracellular traps (NETs), which can kill invading pathogens. NETs can also be deleterious to the host, as they play a role in inflammatory diseases.



Neutrophils stained with DAPI

## Student Summer Experiences continued....



*Electro-fish shocking. One of many massive carp found in Mill Creek, a tributary of the Susquehanna River.*

**Hannah Brubach '14**—Over the summer I held an internship with the Lancaster County Conservation District. While there I followed watershed specialist, Matt Kofroth, and education specialist, Sallie Gregory. Throughout the summer I visited different sites along Mill Creek with Matt to do electro-fish shocking. This data is used to determine whether the introduction of new fish habitat is changing the fish populations over

time. I also led different groups of children in lessons on macroinvertebrate identification while working with Sallie. The District provided me with opportunities to travel with other departments at their office; including the agricultural and erosion and sedimentation specialist. These opportunities showed me departments that I would not have normally been interested in, and in the end enjoyed them.

**Christine Mrozek '15**—My experience this summer in Ecuador was fantastic. In addition to taking 3 courses in Spanish at La Universidad San Francisco de Quito, I was able to spend nine weeks in one of the most amazing places I have ever seen. I lived with a Spanish speaking host family and had plenty of opportunities to improve my Spanish. I was able to spend four days at the Tiputini Biodiversity station in the Amazon rain forest, a center for research run and built by both the University of San Francisco de Quito and Boston University. As both a biologist and artist, I was spellbound by the biodiversity of this country. I was able to explore areas such as mountains, beaches, the rain forest, and the cloud forest. The food and cultural experiences were wonderful as well, and I returned to the United States with both my mind and stomach expanded. I would go back in a heartbeat!



*Bird's eye view of the amazon canopy and Christine getting in touch with her wild side*



*Lauren, taking a habitat structure to an area of the lake known to be used by juvenile fish to provide them with protection from predators*

**Lauren Zatkos '14**—This summer I had the opportunity to intern with the PA Fish and Boat Commission (PAFBC). While interning, I assisted in dam alignment surveys to measure the movement and potential weak points of dams on lakes all over Pennsylvania, as well as learned about and helped build habitat structures for cold-water trout. To perform the dam alignment surveys, I was taught how to operate instruments that recorded precise measurements along the tops of dams, which can be compared to an additional survey taken at a later date in order to observe shifting of the structure. I was also given the chance to go out with staff from the stream habitat department to hike along and observe the condition of cold-water streams and the habitat the streams provided for both juvenile and adult trout. It was during these outings that I was able to learn and see for myself the water conditions and stream characteristics that were best for the trout at different stages of their development. If it was determined that a stream had little or no habitat to support trout populations, I would then help the stream team with

physically building the habitat structures into the banks of the waterway, which would also reduce the amount of soil erosion that was entering the water and improve the stream flow. In addition to the stream department, I worked with the lake habitat department to strategically place pre-made habitat structures into lakes to provide more hiding places for juvenile fish that had low population levels. I was fortunate to become an intern with the PAFBC, as I truly enjoyed the work I participated in and was able to learn from many people from different sections of the commission.

## Study Abroad



*Zip lining through Monteverde Cloud Forest,  
the longest zip line in Latin America*

**Hannah Brubach '14**—I am an environmental science major with a minor in political science. During the spring of 2013, I studied abroad to Costa Rica with CIS abroad. It was an absolutely amazing experience. I took two environmental classes: Tropical Ecology, Environmental Impact and Social Development; and two core classes: Ecological Photography and Spanish 112. Every weekend I went somewhere different. While there I traveled to 13 different places in Costa Rica and for spring break spent a week in Bocas del Toro, Panama. My class each took two weekend long field trips to different locations. I think it would be impossible to choose a favorite place, but my top three in Costa Rica would be: Ostional, Durika, and La Selva Biological Research Station. In Ostional I had the amazing chance to see baby Leatherback sea turtles wading into the Pacific for their first time and Lora sea turtles laying eggs. Durika was a self-sustaining community bordering La Amistad International Park. While there I witnessed the rainforest burning and it caused me to

develop a deeper understanding and care for nature and myself. While at La Selva, I hiked through the rainforest to the sounds of toucans, while howler monkeys ate in the trees above us. Every moment in Costa Rica never ceased to amaze me. I am so thankful for all of the opportunities I was given while exploring the country.



*Samantha at Hobbiton, in Matamata, NZ*

**Samantha Patton '14**—Over the summer, I had a pre-veterinary medicine internship abroad in Auckland, New Zealand. I worked for ten weeks in a small animal hospital in central Auckland, working closely with the staff of Ponsonby Vet Centre. I learned so much at my internship that it's difficult to list it all, including both hands-on techniques and practical knowledge. I was entrusted with tasks ranging from cleaning everything to autoclaving surgical kits, running blood tests to using anesthetic machines, handling patients in all situations to taking x-rays. I was able to scrub in and assist in multiple orthopedic surgeries with a traveling orthopedic surgeon. I also learned pertinent information about medications, dosing for different animals and situations, different surgeries and their benefits and risk, the risks of anesthesia, and the correct way to maintain the health of an anesthetized patient. All of this information and practical knowledge will not only improve my chances of

entry to veterinary medical school, but also gives me a level of confidence in a veterinary hospital that I had not experienced before. I also got to spend the summer in one of the most beautiful countries in the world, which was absolutely life changing.

## Study Abroad



*Lindsey feeding a wallaby in Queensland, Australia*

**Lindsey Zearfoss '15**—I spent the past semester studying abroad at James Cook University-Townsville in Queensland, Australia. Nestled in the tropics just a 20 minute drive from the coast, the campus was gorgeous. Every day walking to class I was surrounded by Australian wildlife, including wallabies, lorikeets, brush turkeys, and kookaburras. While I enjoyed all of my courses, I took a particular interest in my marine biology class. I learned all about the marine ecosystem and the organisms that live within it. For that particular course, I took part in a fieldwork exercise where we spent the afternoon at the local beach collecting sediment samples and recording the types of interstitial fauna we found within them.

When I was not hard at work at “uni”, I made the most of my time abroad. I took three different snorkelling trips out to the beautiful Great Barrier Reef where I got to swim with sea turtles and black-tipped reef sharks. I rode an ATV through the lush tropical rainforest. I fed kangaroos, played with wallabies and cuddled up to koala bears. I made the trek across the Sydney Harbour Bridge, and I lounged on the beautiful white sand of Whitehaven Beach. I even got the chance to spend a week in New Zealand exploring the breathtaking South Island. I had the time of my life in Australia! I made new friends from all over the world, and memories to last a lifetime. I learned a lot about the country and even more about myself. It was an incredible experience that I’ll never forget!

**Lauren Zatkos '14**—I am an Environmental Science major and a Fine Arts minor, and I studied abroad in Costa Rica this past spring. I was accepted to become part of the School for Field Studies (SFS) Sustainable Development Spring 2013 program, which included Topical Ecology, Ethics and Economics of Sustainable Development, Natural Resource Management, and Directed Research courses. While in Costa Rica, I traveled both with class trips and with friends to countless beaches, rainforest preserves, national forests, sustainable communities, volcanoes, and coffee farms. Two of my favorite places we visited in Costa Rica were the Monteverde Cloud Forest where we designed and collected data for an ecology experiment, and Santa Rosa, a national park in which we hiked 11 miles through to camp on a beach. We also traveled to Nicaragua for a week to perform field work and to see for ourselves the differences between development in impoverished areas and development in the most urban part of the county. We stayed on beautiful Ometepe Island for 3 days to experience the effects of isolation on food security, development, and tourism. We then went to Granada, Nicaragua’s capitol city, to compare the characteristics of Ometepe Island to the most developed area of the country. At the end of the semester was my directed research, which focused on the ability of trees in rainforest fragments to sequester carbon from the atmosphere, and how those amounts varied depending on what type of environment surrounded the forest fragments. Overall, I gained an invaluable amount of knowledge that pertains to my major and met and became friends with some of the most amazing people I will ever know. Going abroad to Costa Rica with SFS was one of the best decisions I have ever made.



*Lindsey, exploring “playa azul,” also known as trash beach, during a natural resource management lecture to see the effects of water pollution and trash buildup*





*Sarah holding a baby croc for safety the mouth is taped shut.*

**Sarah Davenport '14**—I spent the entire past year studying abroad at James Cook University in Townsville, Queensland, Australia. My stay in Australia extended into the first half of this summer as well. Aside from attending classes and studying for finals in this time, I had so many amazing and irreplaceable experiences. I met the nicest people I've probably ever met, and they have now become some of my very close friends, and I know the friendships I made will last a lifetime. I held baby crocodiles, python snakes, koala bears, and even got to pet and feed kangaroos. I hiked the rainforest and some of the tallest peaks in Queensland. I went white water rafting, and snorkelling on the Great Barrier Reef! I even saw and touched a sea turtle as it swam past! I also got the opportunity to go on a deep sea fishing trip out on the reef, and caught a coral trout big enough to bring home and cook up for dinner. I climbed the Sydney Harbour Bridge and toured the

Opera House. I basked on the white, sandy beaches of the Whitsunday Islands, and enjoyed scenes at Surfer's Paradise. I took part in charity events at "uni" to raise money for cancer, as well as many social bonding experiences, and I even learned how to play rugby and squash. I loved Australia more than I've ever loved anything, and it will always hold a special place in my heart. Each of my experiences were unique and exquisite, but when asked, "What was your favorite thing about Australia?" my answer will always be the same. The people.



*Haley wearing a red-eyed tree frog*

**Haley Kearns '15**—Where do I begin? My semester spent in paradise, also known as Bocas del Toro, Panama, was the most eye-opening and amazing experience that I have had so far. I woke up every morning to the sounds of exotic birds and ate breakfast in the open-air, eco-friendly lodge with some of the coolest and unique people that I have ever met. Our house was on Isla Solarte, a small island that we shared with an indigenous Ngöbe village and a few scattered expatriots. However, we were not far from civilization; Bocas town on Isla Colón was a ten minute water taxi ride away. Many days we did not even leave the island—our backyard was a rainforest and one of the most desirable snorkeling spots in the region, Hospital Point, was only a short walk from the house.

Before the last month of directed research, we (the seventeen students that I lived with, ate every meal with, and bonded with) began each day at seven a.m. We had class six days a week but spent most afternoons on guided hikes through the forest or snorkeling throughout the archipelago. This trip was not a vacation. I had peanut butter and jelly almost every day for lunch, my showers were cold, each room was allowed one load of laundry a week (there were three people per room), and there was no AC. My hair was constantly frizzy, there was no cell phone service, no WiFi, no TV, and all of our water came from the rain. But you know what? I did not miss any of it. Who needed electronics when you were surrounded by tropical beauty? No one needed to look good—by the end of the day we were always covered with mud. Cold showers? No one cared—there was always the warm, crystal clear ocean to jump into right after. We lived minimally, and we loved it.

The last month of the course was devoted to Directed Research. We studied the impact of temperature change on various tropical amphibians and lizards. For twelve days my group and I went into the forest to catch frogs and lizards with butterfly nets. We caught frogs such as *Oophaga pumilio*—the strawberry poison dart frog, *Craugastor bransfordii*—Bradford's litter frog, and *Agalychnis callidryas*—the red-eyed tree frog. I liked the toads the most because they were big and would usually hop right into my net. Once we caught our quota for the day, we would go back to our makeshift field station and do CTmax testing. In a nutshell, we put frogs into plastic cups, and tried to flip them over with spoons while gradually adding warmer water to their surroundings. At least once an experiment we would have to chase an escapee around the room. During this trip, I stepped out of my comfort zone to discover tropical beauty. My three month trip to Panama will be something I will remember forever.

I spent hours in the field doing research that had never been done before. I felt as though I was a real scientist! This experience helped me realize what I want to do for my future career; I want to be outside and work in the field, researching something that has never been studied before. Without this experience, given to me by School for Field Studies (SFS), I may have never realized that I love being in the field.

## Study Abroad continued...



*Jeff at the Blue Mountain National Park  
New South Wales, Australia*

**Jeff Royer '14**—I am a senior environmental science major. This past spring semester I had the opportunity to study abroad in Australia. I attended James Cook University in Townsville, Queensland, which is well renowned for its tropical, marine, and environmental science programs. The University or “Uni” as it is called by the Australians was a short distance from the shore of the Great Barrier Reef. Throughout the semester, I took courses in marine biology, environmental processes and global change, environmental law, and wildlife ecology and management. The greatest parts about the classes were the field trips and fieldwork. Working and studying at Wambiana Station near the outback with my wildlife ecology class allowed me to collect data and conduct hands-on research on how cattle management regimes affect vertebrate biodiversity in the area. Active searching, trapping, and identifying kangaroos, skinks, geckos, snakes and other native animals allowed for an educational, one-of-a-kind experience. Field trips to the local beach provided the opportunity to study infaunal organisms and permitted a hands-on experience outside of the classroom. The samples and organisms we found would then be examined in the lab. Overall, studying in such a unique, bio diverse environment such as Australia and the Great Barrier Reef was truly a wonderful, life changing experience.

One of the most difficult parts about leaving this country was saying goodbye to my Australian friends at the University as well as the American friends I met from different colleges all around the United States. These incredible, lifelong friendships will always be a remembrance of my time in Australia. Studying abroad also provided the opportunity for me to grow personally and socially by broadening my understanding and views of other cultures and societies. These experiences will never be forgotten!

## Student Club News

**BIOLOGY CLUB** will be featuring two new programs this year: The Lecture Series and the Biology Mentor Program. The Biology Mentor Program is meant to be an aide to the incoming freshman class by providing informal advice and guidance. The Lecture Series is designed to encourage a way for the students to interact with the faculty through individual presentations by the professors. Other programs sponsored by Biology Club include blood drives, holiday parties and potential volunteer opportunities. Any questions or suggestions should be directed towards [biologyclub@etown.edu](mailto:biologyclub@etown.edu).

**TRI BETA** Tri-Beta is the national biology society that aims to expand the appreciation and understanding of the biological sciences while advocating for increased knowledge through scientific research. The club seeks to stimulate interest in the biological field by hosting a yearly speaker. A CV/resume workshop is planned, promoting professionalism and success in the biological sciences outside of undergraduate study. All club members actively participate in tutoring of General Biology students, highlighting the dissemination of knowledge that is critical to the honor society and the field of biology as a whole. If you have any questions feel free to email us at [tribeta@etown.edu](mailto:tribeta@etown.edu).

**MEDICUS** is a student-run organization that encourages each student to pursue a career in the medical field. This year Medicus will be a part of various volunteer opportunities including Into the Streets, cooking at the Ronald McDonald House and Relay for Life. Each year Medicus takes a part in bringing in post graduate school representatives to the Elizabethtown College campus, and giving the students an opportunity to find out information and ask questions about future programs. This year we would like to see PCOM, LCOM, Temple Dentistry, NYCPM and various PA schools. Medicus is dedicated to making the process of finding a post graduate school easier, and are constantly advertising useful events such as [Minority Association for Pre-Medical Students \(MAPS\) Day at Penn State College of Medicine](#). Any questions or suggestions can be directed to [medicus@etown.edu](mailto:medicus@etown.edu).

## Student Recognition

*Students are recognized at our Annual Awards Banquet in April for their educational accomplishments, recipients are shown below*



**Thomas C. Conover Memorial Scholarship**  
 Jessica Albrecht, Christine Mrozek,  
 Megan Fanelli, Joseph Bodnar, Emily Ellis  
 Alissa Roselli and Madison Brown  
 (not pictured) Rachel Fuehrer



**Dr. Charles S. Farver-Appar Award**  
 Martha Farver-Appar and Sarah Sulon



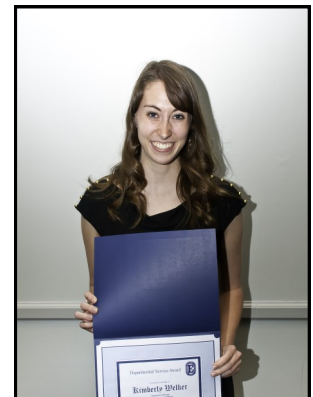
**Dr. Benjamin G. Musser & Vera B. Musser  
 Pre-Medical Scholarship**  
 Shantel Angstadt, Jessica Albrecht,  
 Dylan Carmichael, Martha Klingbeil,  
 Katelyn Reeb and Emily Gockley



**Dr. Charles E. & Mary E. Weaver  
 Biology Scholarship**  
 Roxanne Light and Kaitlin Brubaker  
 (not pictured) Cali Peters



**Outstanding Academic Achievement Award**  
 Melanie Hartman, Kyle Lord, Alisha Martin,  
 Jessica Manchak, Aleah Miller, Scott Douglas,  
 Chelsea Payne, Christopher Maccomb,  
 Kristi Noecker, Laura Wingert,  
 Jessica Tarence, and Matthew Doeing  
 (not pictured) Brittany Benjamin, Erika Harold,  
 Erin Murowany, Lindsay Oberly, Rachel Sulat,  
 Dillon Tagle and Hollyn Olsavick



**Departmental Service Award**  
 Kimberly Welker

## 2013 Graduates

Forty-five students received Bachelor degrees from the Biology Department this past May. Four in Biotechnology, thirty-nine in Biology and two in Environmental Science. Among those who graduated, four graduated with the high distinction of *Summa Cum Laude*, eight graduated *Magna Cum Laude* and six *Cum Laude*. One student graduated through the Elizabethtown College Honors program and seven students graduated with Honors in the Discipline. Among those who graduated approximately 17 students will continue their education and have been accepted at the following colleges and universities: Drexel University, Thomas Jefferson University, Philadelphia College of Osteopathic Medicine, Penn State Hershey College of Medicine, Temple University, Widener University, Salus University, Bloomsburg University, Lake Erie College of Osteopathic Medicine, Arcadia University and Commonwealth Medical College. Students pursuing additional study have enrolled in programs for Medicine, Physical Therapy, Podiatry, Molecular Medicine, Immunology/Cancer Biology, Optometry, Pharmacy and Speech Pathology. We congratulate our 2013 graduates and wish them well in their career and academic pursuits!

## Student Research Presentations



*Back Row: Dr. Jodi Yorty, Dr. Jon Coren, Sarah Sulon, Ceyda Sablak, Mina Abdelshahid, and Dr. Diane Bridge*

*Front Row: Scott Douglas, Melanie Hartman and Sam Thalathoti*



*L to R: Alexander Doran, Lauren Breza, Chelsea Payne, Dr. David Bowne and Aleah Miller*

Biology faculty members and 10 students presented their research at the Beta Beta Beta Northeast District 2 Convention at Lincoln University. Melanie Hartman '13 was awarded first place and Kyle Lord '13 was awarded honorable mention both in the oral presentation category. Elizabethtown College was recognized for having the largest group of delegates at the conference.

Dr. Bowne and four students attended the Mid-Atlantic Chapter of the Ecological Society of America annual meeting in Dover, Delaware. Aleah Miller '13 was awarded second place in the undergraduate student poster presentation category.



Seven of our seniors graduated with Honors in the Discipline this year. They presented their research at the Annual Scholarship and Creative Arts Day held at Elizabethtown in April.

### Students pictured from left are:

*Brittany Benjamin, Alisha Martin, Scott Douglas, Kristi Noecker, Kyle Lord, Melanie Hartman and Christopher Macomb*

**A special thank you to the Biology Students and Faculty who contributed to this Newsletter.**

**Biology Faculty:** David Bowne, Diane Bridge, Jane Cavender, Aaron Cecala, Jonathon Coren, Anya Goldina, Tom Murray, Debra Wohl and Jodi Yorty

**Biology Staff:** Helen Bartlett, Janice Davis

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