

# BIOLOGICAL SCIENCES NEWSLETTER



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#### HIGHLIGHTS FOR SPRING 2016

- Werner Wieland to retire at the end of the spring 2016 semester.
- Faculty and students present at scientific conferences.
- Graduating students admitted to graduate and professional schools.

## PROFESSOR WIELAND TO RETIRE THIS SPRING

After 33 years, **Dr. Werner Wieland** will retire from the university at the end of the 2015-16 academic year. Dr. Wieland joined the faculty in 1983 after earning his Ph.D. from Virginia Commonwealth University. With primary expertise in the biology of fishes, he made a splash as President of both the Virginia Chapter of the American Fisheries Society and the Virginia Academy of Science and a member of the Interagency Coordination Workgroup on Virginia Anadromous Shad and River Herring. He has studied species with such colorful names as the brown bullhead and the bronze darter and recently initiated a turtle survey of Fredericksburg's Rappahannock Canal with the help of several research students. In 2013, he was named Fellow of the Virginia Academy of Science. His service to the university has been extensive, including terms on the Promotion and Tenure and Faculty Affairs Committees. He served as Chair of the Department of Biological Sciences from 2002-2011. Most of all, Dr. Wieland will be remembered for his energy in the classroom. Over the years, he has covered courses such as Biology of Fishes, Vertebrate Zoology, and Animal Ecology, which included an annual survey of grey squirrels on campus. "I have really appreciated Dr. Wieland's enthusiasm for course material, and our fascinating field trip to the Smithsonian's fish collection," said Danny Wehr, a current Biology of Fishes student. Other favorite



Dr. Wieland marks a turtle for a population study in Fredericksburg's Rappahannock Canal.

class field trips have included Moorehead City, NC and Mountain Lake Biological Station. Dr. Wieland's teaching and ability to engage students was recognized with a Distinguished Faculty Achievement Award from the State of Virginia and the university's first Mary Pinschmidt Award, which was chosen by the graduating class of 2000. After retirement, Dr. Wieland and his wife, Linda, plan to stay in the Fredericksburg area, although he may try his hand at heavy equipment operation at Las Vegas's "Big Dig", advertised as a "sandbox for grownups." Sounds like fun! The department thanks Dr. Wieland for his years of leadership and excellence in all areas of his Mary Washington career. - Story by Andrew Dolby.

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## JEPSON SCIENCE CENTER WELCOMES NEW LABORATORY SPECIALIST

The Jepson Science Center hired a new laboratory specialist Katherine (Breece) Sherman this academic year! Breece comes to us from North Carolina where she worked for several years in the pharmaceutical industry. In addition to her other academic support-related tasks, she has been working closely with the natural science departments to prepare the building for its upcoming addition/renovation project. She brings with her extensive chemical handling, hygiene, and tracking experience. Breece now resides with her husband in Stafford County, and when she is not in Jepson, enjoys long walks with her dog and exploring Northern Virginia. Welcome, Breece!



Katherine (Breece) Sherman, Laboratory Specialist for Jepson Science Center.

## BIOLOGY STUDENTS RETURN TO GALAPAGOS ISLANDS!



Students visit the Charles Darwin Research Station on Santa Cruz (photo by Andrew Dolby).



Green sea turtle off Isabela Island (photo by Maggie Magliato).

**Drs. Andrew Dolby and Abbie Tomba** led a group of 25 biology and environmental science students on a return spring break trip to Ecuador's Galapagos Islands. The previous trip ran in 2014. It is the culminating experience of a semester-long course on the natural and cultural history of the Galapagos. The course explores the islands' significance to the development of Charles Darwin's natural selection and other evolutionary theories as well as to ongoing research in evolutionary biology. Additionally, it highlights the unique plant and animal life characteristic of the Galapagos and other isolated island chains. Finally, the course addresses the conservation and management of this fragile ecosystem and United Nations World Heritage site.

The class visited four different islands: San Cristobal, Floreana, Isabela, and Santa Cruz. On San Cristobal, students deftly wielded machetes to clear encroaching weeds around the native *Scalesia* trees planted by the previous students in 2014 (photo bottom right)! On Isabela, they enjoyed spectacular views of Sierra Negra, the world's second largest volcanic caldera. Sea lions, Galapagos penguins, green sea turtles, ma-

rine iguanas, and colorful fish were highlights of several snorkeling and beach excursions. The class also visited three different giant tortoise reserves to learn about their ecology and conservation, and they toured the Galapagos Interpretation Center. Finally, students noted conservation and sustainability measures designed to protect the islands' wildlife and environmental quality.

Upon return from the islands, students reflected on their experiences with the flora and fauna of the Galapagos as well as the local culture and conservation efforts. They also chose topics for more in-depth research, which they will present to the class. "The Galapagos Islands was the most unique place I have ever been; the animals, plants, culture, and landscape were extraordinary," said student traveler Maggie Magliato. The next class will run in 2018.

-Story by Andrew Dolby

*"...the animals, plants, culture, and landscape were extraordinary."*

-Maggie Magliato



Giant tortoise at the Floreana tortoise reserve (photo by Andrew Dolby).



Sea lion poses for students on San Cristobal (photo by Maggie Magliato).



Conservation work in Galapagos National Park (photo by Abbie Tomba).

## GOOD NEWS FOR 2016 GRADUATES!



Leah Roth will enter Virginia Tech's College of Osteopathic Medicine next fall.

- **Erica Falvey** has been offered admission to veterinary medicine programs at the University of Pennsylvania, Tufts University, and Saint George's University.
- **Rebecca Kalinich** has been offered admission to University of Washington's and Eastern Michigan University's master's degree programs in prosthetics and orthotics. She has also been offered an internship at Walter Reed Naval Hospital in association with the Red Cross to make prosthetic limbs for veterans in the United States and abroad.
- **Virginia (Lyle) King** has accepted University of Connecticut's offer of admission to its PhD program in Molecular and Cell Biology.
- **Kristina Krumpas** and **Leah Roth** will both attend Virginia Tech's Edward Via College of Osteopathic Medicine.
- **Rachel Thomas** has been offered admission to medical school by Virginia Commonwealth University and Penn State. She will attend Penn State University College of Medicine.



## THE GREEN GEM OF JEPSON DIGITALLY SHINES!

In the basement of Jepson, there is a hidden gem of the department – the University of Mary Washington Herbarium. This modest collection contains about 4000 plant specimens, mostly from Virginia, the eastern United States, and Jamaica, tucked inside cabinets in a cold room for preservation. Each specimen contains valuable information about the plant species and makes up the herbarium's natural history collection, which has not been shared with the outside world...until now!

The Mary Washington Herbarium recently joined the Southeast Regional Network of Expertise and Collections (SERNEC) consortium as part of a larger international initiative to digitize natural history collections. The consortium includes 230 herbaria in 14 states, but is only one example of such biodiversity collections that are now available online. As part of this project, efforts are underway to update taxonomy and restore each specimen, as well as to

capture resolution image and identification data about each for compilation into the online database. All of this information will be shared with the campus and broader scientific communities and thereby become available to researchers and interested individuals for research and discovery.

Imaging of the collection was started in January 2016 by 11 enthusiastic University of Mary Washington students, and so far, over 1300 specimens have been taxonomically updated and barcoded, with 730 of those specimens imaged and label data entered into the database. By the end of the semester, the entire collection will be digitized and a new phase of the project will begin. Phase two will focus on fully transcribing all label information and georeferencing the collection site into the online database. This phase will provide additional valuable data to the community regarding each species and its distribution.



Dan Noyes works to repair herbarium specimens prior to the digitization process.

If you are interested in more information or assisting in our effort, please contact [awynn@umw.edu](mailto:awynn@umw.edu) or [jspear@umw.edu](mailto:jspear@umw.edu).

-Story by April Wynn

## P-SHOOTER PROJECT TEACHES LABORATORY SKILLS

**Dr. Steve Gallik's** research students are sharpening their *pShooter* skills, but this time it won't land them in detention! The *pShooter Project* gives students an opportunity to study the nature of cellular localization. Currently, five Biology majors are working together to develop a reporter plasmid that, when expressed in mammalian cells, will localize a large fusion protein, made of 3 copies of green fluorescent protein (GFP), to the cell's nucleus. Nuclear localization of the fusion protein requires a nuclear localization signal (NLS), consisting of 9–13 amino acids, be embedded among the copies of GFP. Construction of this plasmid requires the students to generate mutations to a commercially available plasmid (the *pShooter*

plasmid, Life Technologies, Inc.), permitting the insertion into the plasmid of copies of the GFP gene, along with the DNA sequence for the NLS. Once constructed, the plasmid can be used by future Biology majors to test their own hypotheses regarding the dependence of nuclear localization on the sequence, size, and location of the NLS. Beyond the scientific merit of this work, the *pShooter Project* gives students an opportunity to develop their own hypotheses regarding the nature of cellular localization signals, design their own experiments to test their hypotheses, develop a working understanding of a variety of molecular biology methods, and learn more about the use of localization signals in cells. Students currently involved in this project include Kristina



Kristina Krumpos, Class of 2016, busy in the lab!

Krumpos, Rachel Thomas, Kristin Jones, Kit Qualls, and Sarah Roche.

-Story by Steve Gallik.

## Faculty Notes

- **Andrew Dolby** was named editor of *The Raven*, the scientific journal of the Virginia Society of Ornithology.
- **Lynn Lewis** co-authored a paper in the journal *Virology* titled "Genomic characterization of seven *Myoviridae* bacteriophage infecting *Bacillus thuringiensis*."
- **Abbie Tomba** presented a poster titled "Digenetic trematodes of eastern Virginia: an ode to DNA barcoding" at the annual meeting of the Association of Southeastern Biologists in Concord, NC. Two students in her lab also presented posters.
- **Parrish Waters** co-authored a poster titled "Exploring the sociality of mice to model human psychopathology" at the Symposium for Young Neuroscientists and Professors of the SouthEast (SYNAPSE). The poster was presented by two students in Dr. Waters' lab.

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### **SPECIAL THANKS TO OUR RECENT PROGRAM DONORS:**

- Felicia Baxter, Chattanooga, TN
- Gina D'Eramo, Worcester, MA
- Sally Brennan Hurt, Midlothian, VA
- Cynthia Rohrbach, Summertown, TN

The mission of the biology program at the University of Mary Washington is to provide a strong undergraduate education in the fundamental principles of biology and train students in the research methods and techniques used by biologists. The program is designed to prepare undergraduates for future careers in life sciences research, biotechnology, teaching and related professions, conservation, medicine, dentistry, and other allied health fields.

For further information about the biology program, please contact Andrew Dolby, Chair, Department of Biological Sciences, at [adolby@umw.edu](mailto:adolby@umw.edu) or 540-654-1420



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## **UPDATE FROM GINA AYERS, CLASS OF 2012**

It is hard to believe that it has already been four years since I graduated from the University of Mary Washington with a B.S. in Biology. Time has flown since graduating in 2012. Since then, I have been working toward a Doctor of Pharmacy degree at the Bernard J. Dunn School of Pharmacy at Shenandoah University, where I will graduate in May of this year. I came to UMW knowing that my ultimate goal was to become a pharmacist. Currently, pharmacy schools only require prerequisite coursework upon entering pharmacy school; a bachelor's degree is not required. Initially, I had full intentions of only staying at UMW for two years to complete my pharmacy prerequisite coursework. However, it soon became clear to me that a degree in Biology would provide me with the best foundation upon which to build my post-graduate studies. I expected courses such as anatomy, physiology, and microbiology to play a major role in preparing me for my

for my pharmacy coursework, but was pleasantly surprised when I was able to apply information from courses such as genetics and cellular biology, which were not pharmacy prerequisites.

Though I am appreciative of the knowledge that I gained during my time at UMW, I am most grateful for incredible mentors, such as Dr. Baker, who invested her time into my success as a student and encouraged me to reach for my dreams. Dr. Baker also provided me with the opportunity to assist in a research project during my time as an undergraduate, which prepared me for experiences in pharmacy school such as my fourth year research project and publication in a peer-reviewed journal.

I recently learned that I matched at my first choice residency program with the University of Pittsburgh Medical Center, where I will receive more focused training in geriatrics upon graduating. I am looking forward to beginning my career in pharmacy and owe a large part of my success to the opportunities that I was provided at UMW.



Gina Ayers, Class of 2012.

*"...I am most grateful for incredible mentors, such as Dr. Baker, who...encouraged me to reach for my dreams."*

*-Gina Ayers*