

## Welcome to a new Academic Year!



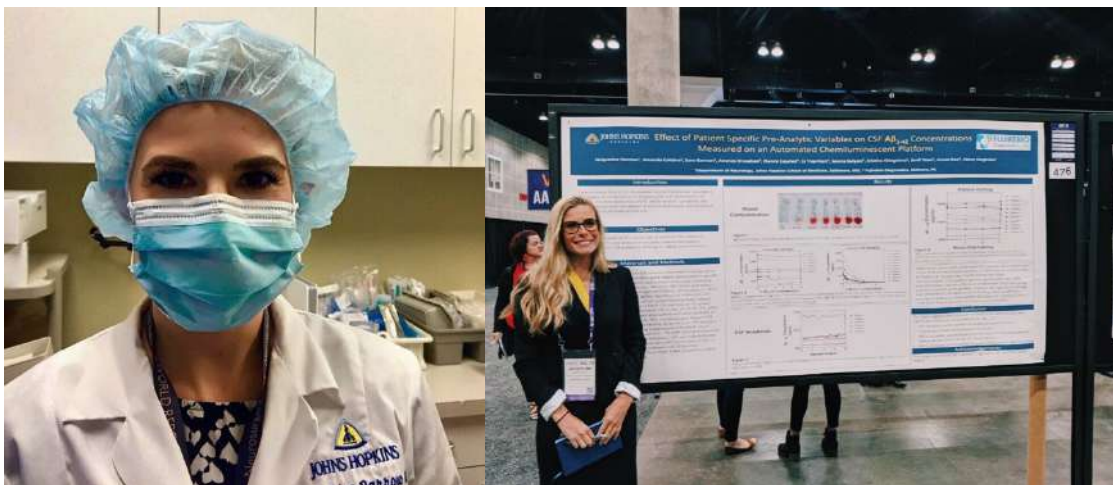
## Two-tailed salamander – How cool is that?



Liebgold EB. 2019. A tale of two tails: A rare occurrence of tail bifurcation in the red-backed salamander (*Plethodon cinereus*). *Herpetological Bulletin* 148:35-36.

## Biology Alumni

### Jackie Darrow



Since graduating Salisbury from the SU Biology Master's Program in 2015, I started working for The Johns Hopkins School of Medicine, Neurology & Neurosurgery Departments. Over the last three years, I have been involved in multiple studies that primarily focus on cerebrospinal fluid (CSF) disorders including Alzheimer's Disease (AD), Normal Pressure Hydrocephalus (NPH), and Pseudotumor cerebri. A unique aspect of my job is I am able to complete laboratory research and have patient interaction. I am able to see a sample collected at the patient bedside (collecting CSF from a lumbar puncture and conducting blood draws) to being processed and analyzed in the lab.

This past July, I was able to present our AD research: Effect of Patient Specific Pre-Analytic Variables on CSF Aβ1-42 Concentrations Measured on an Automated Chemiluminescent Platform, in collaboration with Fujirebio, at the Alzheimer's Association International Conference in LA. I also presented my work on NPH: Evaluation of Alzheimer's Disease Related CSF Biomarkers in Idiopathic Normal Pressure Hydrocephalus at the International Society for Hydrocephalus and Cerebrospinal Fluid Disorders in Vancouver this past September. I am also the lead project manager on other projects pertaining to the Fujirebio Lumipluse platform, completing multiple experiments of several pre-analytic and analytic variables that are been shown to affect AD CSF biomarkers using current individual and multiplex ELISAs. In addition, I am the blinded assessor in the PENS-A Placebo-Controlled Effectiveness in INPH Shunting Trial: Proof of Concept, conducting memory and gait testing on subjects.

A major longitudinal project I have been working on is preparing, coordinating, processing, and distributing bio-specimens for critical NIA sponsored longitudinal BIOCARD study: Predictors of Cognitive Decline Among Normal Individuals. This study aims to identify predictors of cognitive decline among normal individuals. The domains of investigation being examined include cognitive testing, magnetic resonance imaging, cerebrospinal fluid and blood. The primary question is whether measures from these domains, alone or in combination can predict which normal individuals will develop cognitive decline over time, crucial for AD research.

Daria Pidhorodetska

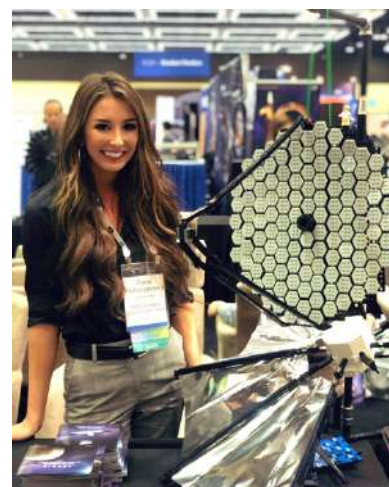


After graduating from Salisbury University with a Bachelor's degree in Biology in December 2017, I moved across the Bay Bridge and began working as a Research Scientist at the NASA Goddard Space Flight Center. As a classically trained biologist who is interested in astronomy, I've uncovered a unique opportunity to bridge the gap between the two through the interdisciplinary field of Astrobiology. Astrobiologists look for life outside of Earth, whether it is on another planet, moon, or other solar system object. The search for life is a complex problem that can be solved many different ways, but I specifically focus on understanding what we can learn about a planet outside of our solar system by probing its atmosphere with space-based telescopes and searching for signs of life called biosignatures. Until technological advances allow us to put these large observatories in the sky, the best way to predict and plan for future NASA missions is through theoretical modeling of these planets and their atmospheres.

Simulating what we may find is the first step in designing the correct instrumentation to carry this out, so I work on teams of researchers that use atmospheric models to understand what may be happening on the surface of a planet that we can't quite see yet. I have been involved in multiple studies thus far, but two of the most prominent are my work on TRAPPIST-1e; an Earth-sized planet 40 light years away from us, and the L 98-59 system; three planets orbiting a star even closer to us that have been fundamental in increasing our sample sizes of multi-planet systems.

In addition to doing exciting research, these projects have opened the doors even further for me to start working with teams who are currently designing missions for the future. Seeing how the ability to answer small-scale questions can turn into big picture discoveries and opportunities has been my favorite part of being a scientist.

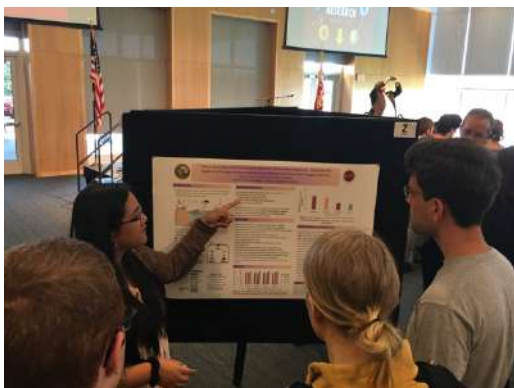
I have had the pleasure of presenting much of this work at conferences all over the world in places like Belgium, Switzerland, Seattle, and Washington D.C., and look forward to observing the L 98-59 system with the Hubble Space Telescope in the near future, granted through a successful proposal call to the Space Telescope Science Institute (STScI).





## Our Students

### Summer Student Research Showcase



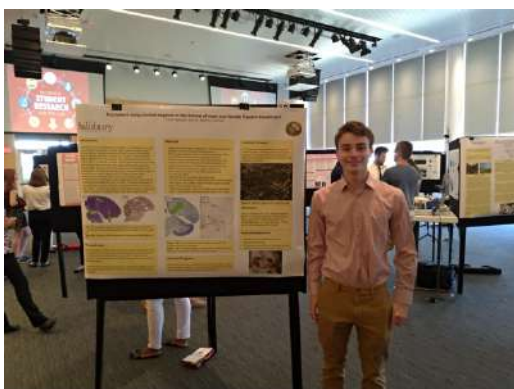
**Jeremie Barbosa**

Human Low-Dose Environmentally Relevant Heavy Metal Exposure: Signaling and Epigenetic Changes of the Innate Immune Response Induced by Inorganic Arsenic  
Faculty Mentor: Jennifer Nyland



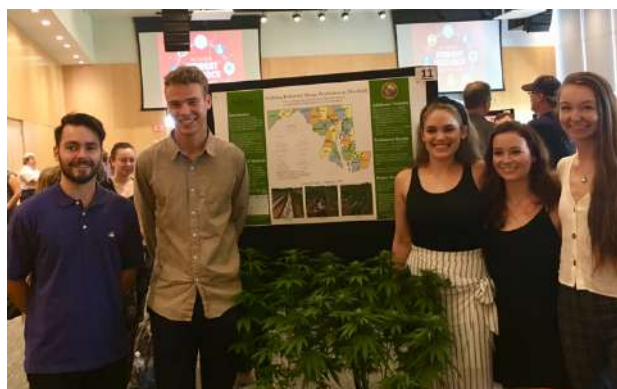
**Kathryn Breon**

The Real Threat to the Species and Ecosystems of Earth  
Faculty Mentor: Aaron Hogue



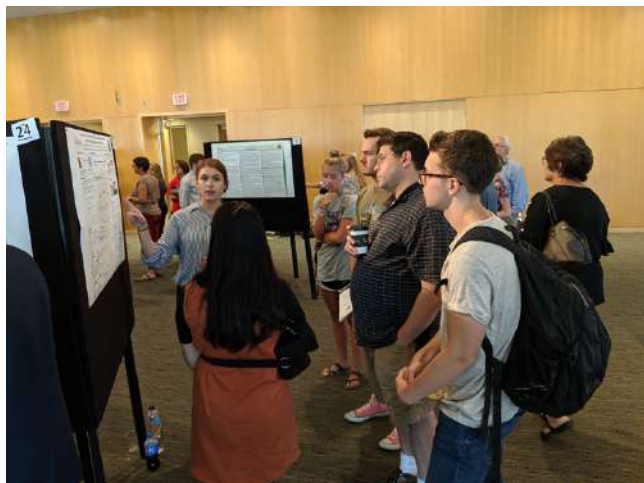
**Colin Cassidy**

Examining the Statistical Probability of Equivalence Between Male and Female  
Sialia Sialis Song Control Region Volumes  
Faculty Mentor: Jeremy Corfield



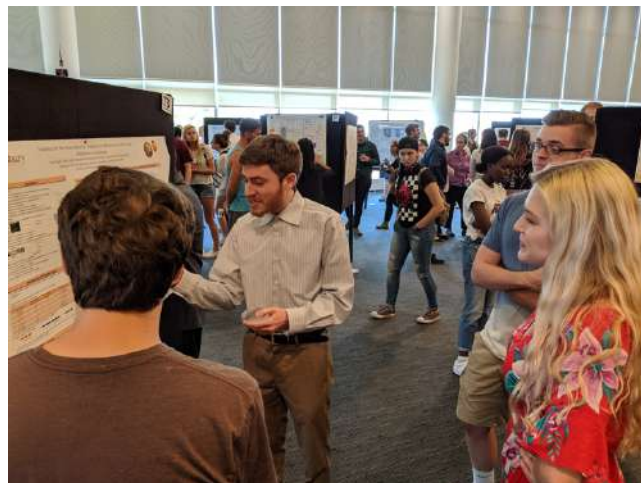
**Sam Chisholm, Audrey Schirmer, Kevin Auerbach,  
Jamie McBain, Josey McGoldrick, Nina Sedrakyan &  
Sara Collins**

Preliminary Findings of Maryland's Pilot Industrial Hemp Crop  
Faculty Mentors: Mark Holland and Les Erickson



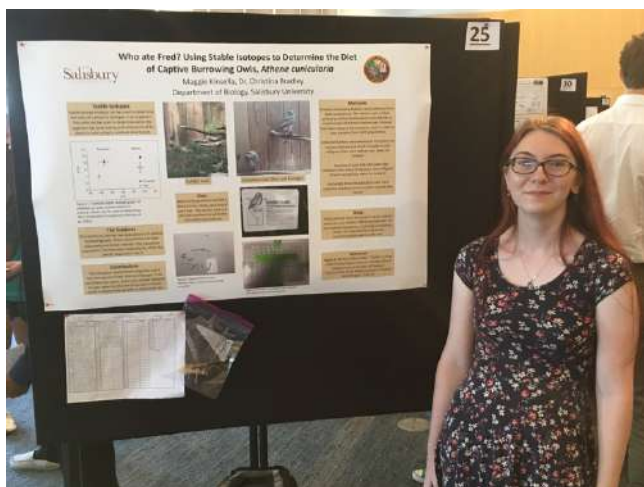
**Madison Jermain, Khadija Bhatti, Yadanar Than Naing,  
Ryan Joyce & Tyler Stack**

Investigating the Use of Biological Transporters in a Novel  
Metabolic Pathway to Utilize L-Ascorbate as a Carbon Source  
in *Ralstonia eutropha*  
Faculty Mentor: Michael Carter



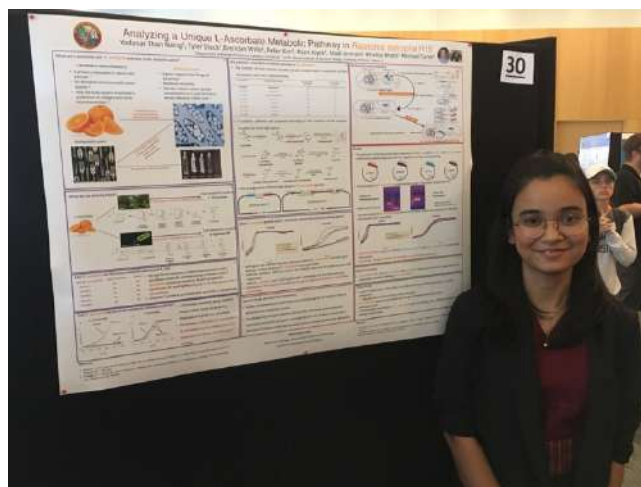
**Ryan Joyce, Tyler Stack, Khadija Bhatti, Madison  
Jermain & Yadanar Than Naing**

Evidence for the Novel Metabolic Pathway of *Ralstonia*  
*eutropha* H16 to Metabolize L-ascorbate  
Faculty Mentor: Michael Carter



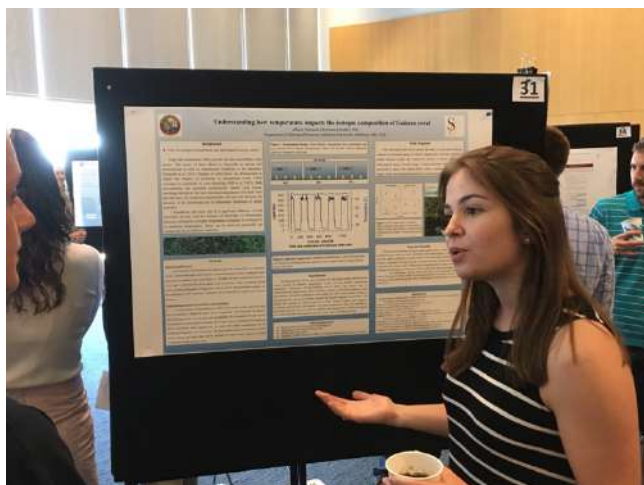
**Maggie Kinsella**

Stable Isotope Analysis of Captive Burrowing Owls  
Faculty Mentor: Christina Bradley



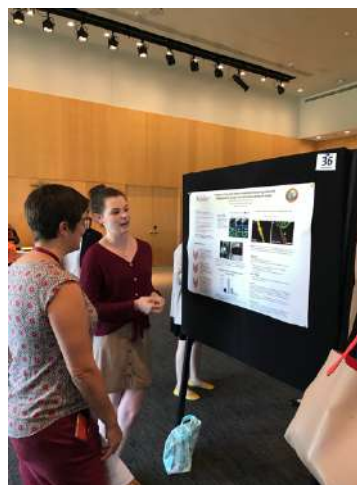
**Yadanar Than Naing & Khadija Bhatti**

Analyzing a Unique L-Ascorbate Metabolic Pathway in  
*Ralstonia eutropha* H16  
Faculty Mentor: Michael Carter



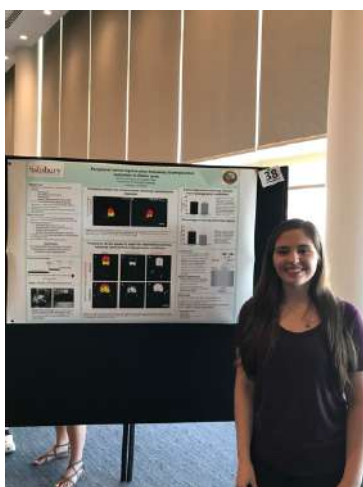
**Allison Nalesnik**

Understanding How Temperature Impacts the Isotopic Composition of Galaxea Corals  
Faculty Mentor: Christina J. Bradley



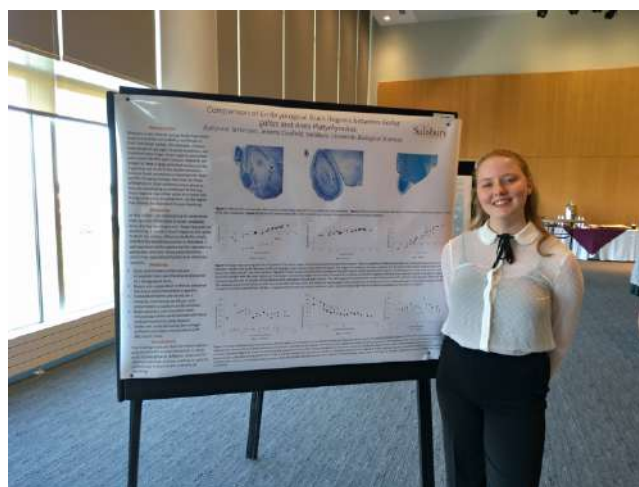
**Jessica Pierce**

Integrity of the Optic Nerve in Zebrafish Larvae Following Induced Hyperglycemia Using a Nitroreductase Ablation Model  
Faculty Mentor: Jessica Clark



**Sheridan Sargent**

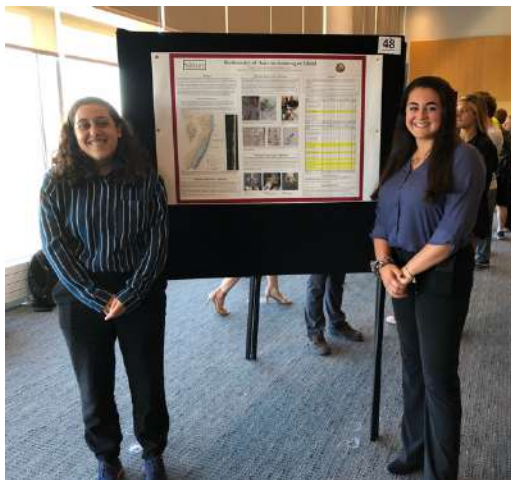
Peripheral Nerve Regeneration Following Hyperglycemic Induction in Danio rerio  
Faculty Mentor: Jessica Clark



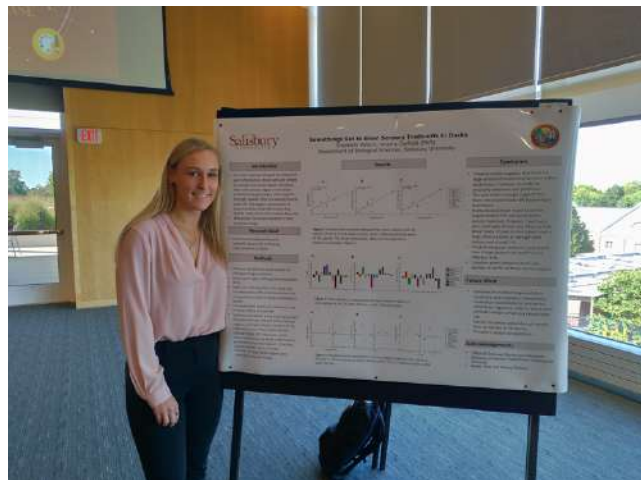
**Katlynn Tatterson**

Embryonic Brain Development of Chicken and Mallard  
Faculty Mentor: Jeremy Corfield





**Abigail Wilson & Denise Manole**  
Biodiversity of Ants of Assateague Island  
Faculty Mentor: Dana L. Price

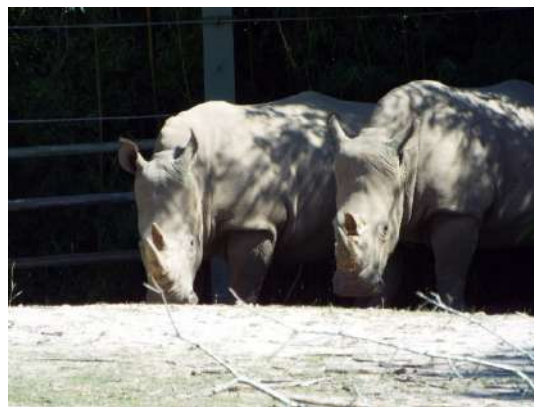


**Elizabeth Wilson**  
Sensory Trade-offs and Co-operation in Duck Brains  
Faculty Mentor: Jeremy Corfield

### BIOL 105 Visits the Virginia Zoo



On Saturday September 21<sup>st</sup>, BIOL 105 History of Zoos, visited the Virginia Zoo in Norfolk as part of a required field trip for the class. Students applied what they are learning in class to look at the exhibits and identify not only types of barriers and materials they are made of but also enrichment items for the animals as well as education and conservation programs at the zoo. It was World Rhino Day so they got to learn a little extra about these amazing and threatened creatures.



### The Future of Cancer Immunotherapy

Students from Contemporary Genetics and the American Society for Biochemistry and Molecular Biology (ASBMB) traveled to Washington, D.C. on September 11 to hear Nobel Laureate Dr. James Allison speak to the Congressional Biomedical Research Caucus (CBRC) about the "Future of Cancer Immunotherapy". The presentation was hosted by the Coalition for the Life Sciences, an advocacy group promoting policies that support biomedical research. The Nobel Prize in Physiology or Medicine 2018 was awarded jointly to James P. Allison and Tasuku Honjo "for their discovery of cancer therapy by inhibition of negative immune regulation."

<https://www.nobelprize.org/prizes/medicine/2018/summary/>



Left to right: Collin Dunnam, Gabrielle Voithofer, Anthony LaBarck, James Allison, Patti Erickson, Allison Nalesnik

### Amanda Rocker – New Graduate Student



My name is Amanda Rocker and I am continuing my education at Salisbury University after completing my undergrad at SU this past spring. I have a passion for animals and the conservation of wildlife which I aim to include in my future career. During my Master's program I will study the endangered spotted turtle in the region through Dr. Eric Liebgold's herpetology and ecology lab. With this research I intend to determine current population estimates and compare these to past data to better understand the status of their population now, along with potential predation that may further threaten the already declining species. I look forward to this new journey and am anxious to start "saving the turtles"!



### Astrobiology class visits the Goddard Space Flight Center



Students in Biol 326, Astrobiology, visit the Astrobiology Laboratory at Goddard Space Flight Center in Greenbelt, Maryland. From Left, Abigail Anderson, Cheyenne Wopman, Maliyah Martel, Sam Ramsey, Kevin Auerbach, and Anders Croft listen as Dr. Jose Aponte (far right) describes how his team has discovered and analyzed organic compounds in meteorites. Many of the molecules characteristic of life on Earth are synthesized abiotically in the universe.

### Gabi Voithofer



Gabi Voithofer presenting her research, "Peripheral nerve degeneration following hyperglycemic induction with 120mM glucose (Danio rerio)", at St. Jude's at the National Symposium for Undergraduate Research, 12-15. Memphis, TN. Research mentor: Dr. Jessica Clark.

### Global Climate Strike in Washington DC



Drs. Nyland and Quillin organized their Sustainability & Global Climate Change LLC students (taking Dr. Nyland's HONR 111 and Dr. Quillin's BIOL 210) to participate in the Global Climate Strike march in Washington DC on September 20<sup>th</sup>. It was a great day for a protest march and school strike to advocate for Climate Science! Thanks to the Environmental Studies department for letting us join them on their bus to the march.

## Our Faculty

### Dr. Jessica Clark



Dr. Clark received a grant to attend the NIH Brain Initiative Summer Course on Models and Neurobiology, hosted by the College of Engineering at the University of Missouri.

Dr. Clark and her students also published a paper: Hannah Ennerfelt, Gabrielle Voithofer, Morgan Tibbo, Derrick Miller, Rebecca Warfield, Samantha Allen, and Jessica Kennett Clark. 2019. Disruption of peripheral nerve development in a zebrafish model of hyperglycemia. *Journal of Neurophysiology* 122: 862-871.

Eric Liebgold – Tales from a Sabbatical



In spring of 2019, I went on sabbatical to California to meet with and go in the field with California Tiger Salamander researchers as well as catch up on A LOT of scientific writing. California tiger salamanders used to be considered conspecific with the Eastern Tiger Salamanders (*Ambystoma tigrinum tigrinum*) that my students and I study here on Delmarva (where it is state-endangered) but California tigers were split to be their own species (*Ambystoma californiense*) that is state-endangered and federally threatened. (Shameless plug: Hannah Small, one of my Masters' students, will be presenting her tiger salamander thesis research at a Biology seminar on November 21.)

Meeting several prominent California tiger salamander researchers (Derek Girman of Sonoma State University, Dave Cook of Sonoma County, and Jeff Alvarez of The Wildlife Project) allowed me to accomplish several goals: getting me out in California tiger salamander habitat which was both different and the same as our habitats, investigating their methods of capturing and studying tigers such as pitfall traps, and getting feedback and sharing information on the research we are doing in our SU lab with tiger salamander experts, as well as capturing and handling federally-listed California tiger salamanders. I also participated in a California tiger salamander workshop which focused on federal and state rules and methods for studying CTS and mitigation efforts for helping tiger salamander populations that we do not do here in the east such as tunnels for migration under roads and fish removal (which DE is planning on trying this year in a couple of ponds!). I plan to take what I learned and use it to help develop a long-term plan for our Eastern tiger salamander research here at SU as it moves forward over the next few years.



Tiger salamander habitat, with pitfall traps.



Tiger salamander tunnel under roadway.



Sabbatical also involved a lot of scientific writing and resulted in at least five publications, including “The right light: Tiger salamander capture rates and spectral sensitivity” which is in press in the Wildlife Society Bulletin, and publishing several non-tiger salamander papers from previous projects that I just needed time to write up: “Density-dependent fitness, not dispersal movements, drives temporal variation in spatial genetic structure in dark-eyed juncos” in the journal Molecular Ecology, “The spread of the parthenogenetic Mourning Gecko to Paradise Island The Bahamas, with comments on citizen science observations of non-native herpetofauna” in Bioinvasions Records, and “A tale of two tails: A rare occurrence of tail bifurcation in the red-backed salamander” in Herpetological Bulletin. Additionally, several more SU student-helmed papers were submitted towards the end of my sabbatical and are in revision including research on ground-nesting warblers by former undergraduate student Ravyn Neville (nee Saunders) and former Masters’ student Stephanie Lamb.

This isn’t to say I didn’t have any fun on sabbatical (although writing can be fun too!). In order to live in California for an atypical time period (5 months), the easiest thing for us was to get a ski lease up at Lake Tahoe. Our condo was at an elevation of 6000 ft near the ski resorts Squaw Valley and Alpine Meadows. So a typical day for me was skiing in the morning, writing in the afternoon, repeat, with multi-day visits down the mountain to the California tiger salamander habitat during the breeding season. It snowed pretty much the whole time! Squaw Valley had their 3rd highest winter snowfall ever with 60 feet of snow (yes, you read that correctly, 719 inches to be exact!). February alone had more than 26 feet of snow, their highest monthly snowfall total ever! So yes, when I wasn’t writing or just trapped by snow in the condo, we were on the mountain on amazing powder (my son skies, Tami boards, and my daughter started snowboarding and became an expert while we were there). Overall, my sabbatical worked out great professionally and personally and was filled with so much snow (and writing and tiger salamanders of course).



Mary Gunther Attends Association of Zoos and Aquariums (AZA) Annual Conference



Mary Gunther attended the 2019 AZA Annual Conference in New Orleans September 7-12. Mary presented a poster "Zoo House Rock: Salisbury University and The Salisbury Zoo" which detailed the work of the Zoo FLC. She was able to obtain a lot of information and make contacts to help in the development of an Honors Wildlife Trafficking class being developed here at SU. There was an entire session on this topic and Mary was able to meet with Sara Walker, Senior Advisor on Wildlife Trafficking AZA. USFWS is also developing a curriculum on Wildlife Trafficking CSI and Mary participated in those discussions as well. Overall she came back with much information to process. As part of the conference Mary visited the Audubon Aquarium, the Audubon Insectarium, the Audubon Zoo and the Freeport-McMoRan Audubon Species Survival Center. And she talked with Jack Hanna (above) who she worked with many years ago on one of his TV shows!



### Industrial Hemp Growing returns to Maryland after 70 years with the help of SU Researchers and Student Interns.

Legislation enacted last year by our Maryland legislature invited farmers to apply for permits grow industrial hemp in 2019 under a special pilot program after a hiatus of 70 years. One catch however, was that participation in the pilot program required growers to partner with an institution of higher education and to include a component of research with their project. SU researchers Mark Holland and Les Erickson, along with 7 student interns: Audrey Schirmer, Nune Sedrakyan, Sara Collins, Kevin Auerbach, Seosaimhin McGoldrick, Samuel Chisholm, and Jamie McBain provided the necessary research support for 21 growers. Most growers this year are interested in the production of CBD oil by the hemp plant and research involved treating hemp plants with a probiotic bacterium developed in the Holland lab to see whether the bacterium has any influence on plant growth or CBD production. Interns have been monitoring the growth of the treated plants throughout the growing season. Now, at the beginning of October, as our growers are harvesting the crop, their attention will turn to analyzing crop yield in terms of biomass and oil production.



Student interns Kevin Auerbach & Sam Chisholm gathering data from Maryland's first industrial hemp crop.

### Dr. Dee Morrison-Parker inducted as Honorary Member of the Phi Eta Sigma Honors Society



Dr. Melissa Boog stated: "It's important to note that this is not the only year in which Dr. Morrison-Parker (rear) has been nominated. Her earliest nominations date back to 2014, and year-after-year, there has been a consistent theme – Dr. Morrison-Parker is helpful and, in the simplest of terms, she is kind. One student noted that Dr. Dee (as some of the students call her), "was always involved in our learning. She came to my Biology 210 class in an enthusiastic mood and made my love and interest for biology even stronger." Yet her attention and dedication doesn't stop with the discipline she teaches. One student discussed the trepidation of balancing school work, sports, and illness and explained that Dr. Morrison-Parker "helped [her] get through this difficult time in [her] life."



Bonfire at Assateague Island for Professor Emeritus Judith Stribling



Ellen Lawler – Professor Emeritus & Artist



On Saturday, October, 19, I'll again be exhibiting at the Annual Fall Arts and Crafts show held in the Independence 55+ Community northeast of Millsboro, DE. The show runs from 9am to 2pm. Although a small show, it is a very nice one in a lovely community center. For more information, see <http://www.independencehoa.net/info.php?pnum=65c9b920098f5b>. Among works I plan to have there is "Morning Light" of a pair of Tundra swans.



Then on Saturday, Nov. 16, I'll be showing at the Eastern Shore Fine Arts and Crafts Show here in Salisbury. This show is organized by Laura Ellison, one of my former SU students, who now designs and makes lovely jewelry. For many years, Laura organized (and I exhibited in) a show at the YES Gym in Fruitland. After a hiatus, Laura moved the show to a larger and more convenient location - the Moose Lodge on Snow Hill Rd. in Salisbury. I'm looking forward to again participating in this show which always has an interesting group of artists and artisans. More information will likely be posted on Laura's Facebook page - <https://www.facebook.com/pages/category/Jewelry-Watches/Laura-Ellison-Designs-1669245059998036/>. Among the work I'll be exhibiting there is "Desert Delights" of a Rufous Hummingbird and Prickly Pear Cactus (which won a second place ribbon at the Worcester County Arts Council earlier this year).



I'm a member of a number of local arts centers and plan to submit work to some of their upcoming shows, including the Annual Members Show at Salisbury Art Space which runs from Oct., 9 – Nov. 21 (<http://salisburyartspace.org/>); the Juried Members Show and Small Works Show which run concurrently at the Center for the Arts in Ocean City from Dec. 6 – Dec. 28 (<https://artleagueofoceancity.org/>) and the Small Works show at the Worcester County Arts Council in Berlin (<http://www.worcestercountyartscouncil.org/>). I've not yet decided what works I'll be submitting, but "Athena's Bird" of a Screech Owl will likely be one.





## Alumni Connection



## SU BIOLOGY ALUMNI

### Stay Connected !

We want to hear from you! Please let us know where you are living and what you are doing! We would love to hear from you. In the future we plan to have an Alumni Connection section in our newsletter.

Send information to: Sandra Ramses, Program Management Specialist  
[SHRAMSES@SALISBURY.EDU](mailto:SHRAMSES@SALISBURY.EDU)

## Your Editor



Dr. Chris Briand

Send any contributions to [chbriand@salisbury.edu](mailto:chbriand@salisbury.edu)

## How can you help Biology at SU? Here are a few ways!

Help us help our majors at Salisbury University Biological Sciences  
The mission of the [Biological Sciences Department](#) is to provide first-rate educational opportunities for biology and health-discipline majors in preparation for advanced degree work or postgraduate employment. Our degree programs provide students with the knowledge and abilities to apply the scientific process and to think critically about contemporary issues in the biological sciences.

How you can make a difference!

Our faculty need your help to provide our students with excellent classroom instruction and research opportunities. Your gift, no matter the size, combined with others, will help the Biological Science department provide our students with an unmatched comprehensive educational program. Your investment will provide much needed assistance in equipment upgrades, research grant assistance and new equipment purchases.

<https://salisburyu.givecorps.com/projects/3746-henson-school-of-science-technology-department-of-biological-sciences>



### Remembering Dr. Harry Womack

A PROJECT OF [HENSON SCHOOL OF SCIENCE & TECHNOLOGY](#)

Harry was a no nonsense, simple, down to earth man with a somewhat earthy sense of humor. He was extraordinarily generous and always willing to lend a hand to a friend or stranger. Teaching was both his passion and profession, and he

cared about his students and his role as a teacher. A devoted family man, he had been a source of help and unconditional love and loyalty. He touched the lives of many. We will miss him greatly.

How you can make a difference!

Dr. Womack made an enormous impact on many students over the years as a teacher,

a mentor and as a friend. Make your gift today to honor his impact on so many lives throughout his career. Your gift, whatever the size, will make a difference.

<https://salisburyu.givecorps.com/projects/37123-henson-school-of-science-technology-remembering-dr-harry-womack>

