

Bioluminescence

What's glowing in the Biology Department

Inside the Issue:

AERS Meeting 2

Faculty Development 4

STEM Up 4

Student Leaders 5

ExEd Spotlight 6

TriBeta 7

Adjunct Spotlight 7

Lab Safety 9

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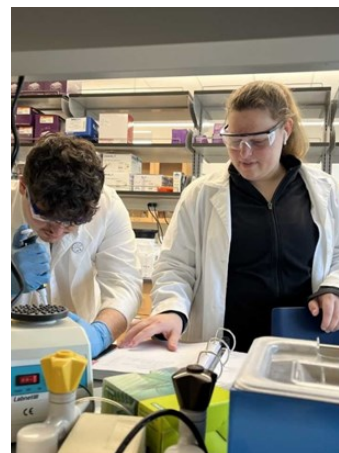
April 2023 Volume III, Issue I

Biology Undergraduates Excel in Research

During the Covid-19 pandemic, the Biology Department never completely stopped research efforts, but work in the laboratories was suspended for several months, and when the laboratories re-opened, social distancing needs and remote schedules made it more difficult for research progress to continue. Now, we are all back! The research laboratories are fully operational again, and students are filling the halls and working on their projects. We have a lot of successful undergraduate researchers who have gained attention for their work this year.

At the end of the Fall semester, Noa Bass and Dianelys Garcia were both sponsored by a School of Science travel grant to present posters at the American Society for Cell Biology national meeting in Washington, DC. Their work was presented twice – once at a special session for undergraduates, and a second presentation was during the

“signal transduction” poster session of the annual meeting (which was mostly attended by investigators, post-doctoral fellows, and graduate students). Noa, Dianelys, and a third student in the laboratory of Dr. Dottie Lobo, Michael Catalfumo, had been performing tissue culture to maintain two cancerous and one normal cell line, and to subsequently treat the cells with various essential oils and analyze their resulting effects on proliferation and molecular signaling. This work was an offshoot of work on the antibacterial effects of essential oils in the laboratory of Dr. James Mack, and Noa first heard about the research through a Zoom meeting her freshmen year, and reached out immediately to professors that were conducting on-campus work. Noa’s poster was on the effects of manuka essential oil on the proliferation and stress signaling in HT-1080 fibrosarcoma cells. This is a project that she



Michael Catalfumo and Noa Bass at work in the research lab.

has been working on since the beginning of her sophomore year, including time in the summer through her participation in the Summer Research Program sponsored by the School of Science. Noa has also won a research grant and travel award for her project from the Biology **(continued on p. 3)**

In Memoriam: Jessica Jacho, 24



The Biology Department mourns the loss of one of our students, Jessica Jacho, who passed away suddenly while playing soccer with her friends on June 19, 2022. An animal lover and a first-generation college student, Jessica was aspiring to become a veterinarian and worked several jobs while attending school so that she could progress towards this

career. She was a double minor in Spanish and psychology, and she hosted a Spanish radio show on the Hawk radio station. She is remembered in the Department as being energetic, upbeat, and always positive, even when classwork was overwhelming. She is missed by her Hawk family.

Monmouth University Hosts AERS Meeting

Monmouth University was the site for the Atlantic Estuarine Research Society (AERS) Spring meeting. (March 23rd – 25th), with three days of meetings, posters, presentations, and field activities. AERS is a non-profit society, with the goal of serving as a platform for research and discussion of estuarine-related problems from New Jersey to North Carolina, bringing students, educators and managers together. Dr. Jason Adolf served as one of the local hosts for the meeting, and Assistant Dean John Tiedemann was invited to give a welcoming keynote speech, which is abstracted below. Dr. Keith Dunton, Dr. Sean Sterrett, Dr. Daneshgar, Erin Conlon, Tom Herrington and Dr. Adolf also gave presentations at the meeting, along with undergraduate students Jessie Maguire, Emma Cusano, Emma Gould, Einat Shayer, Marie Mauro, Christopher Meehan, Richard Robinson, and Adriana Simancas.

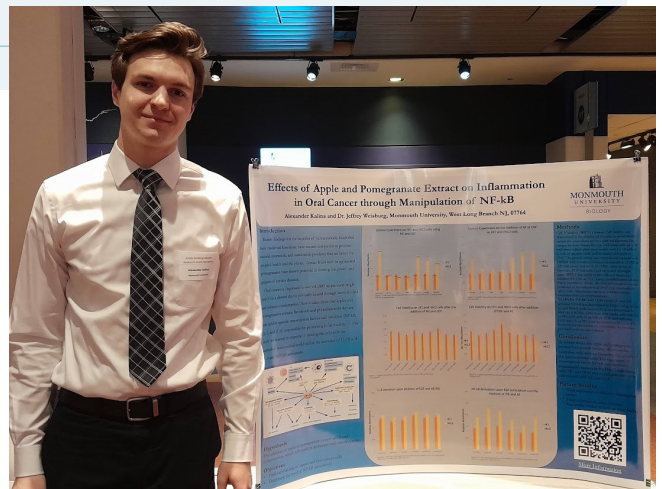
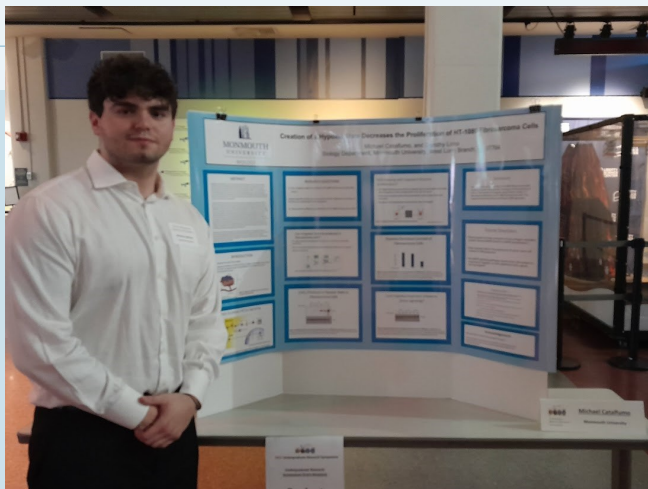


REFLECTIONS ON SHIFTING BASELINES IN THE NEW YORK BIGHT: A 50 YEAR RETROSPECTIVE

John A. Tiedemann
 Assistant Dean, Monmouth University
 School of Science
 Director, Monmouth University Marine and Environmental Biology and Policy Program

Keeping pace with resource management needs in an era of dynamic change can seem like an ominous task. One of the obstacles to addressing the wide range of current environmental issues is the ab-

sence of an historical perspective on past environmental conditions. Since the 'Decade of the Environment' a variety of natural and anthropogenic happenings have caused the New York Bight's environmental baseline to shift. With so many challenges ahead, a review of the of the Bight's environmental history over the past 50 years offers a unique view of the relationship and interaction of society and the oceans. Putting past environmental conditions in perspective is critical to developing contemporary environmental conservation, restoration, and management goals.

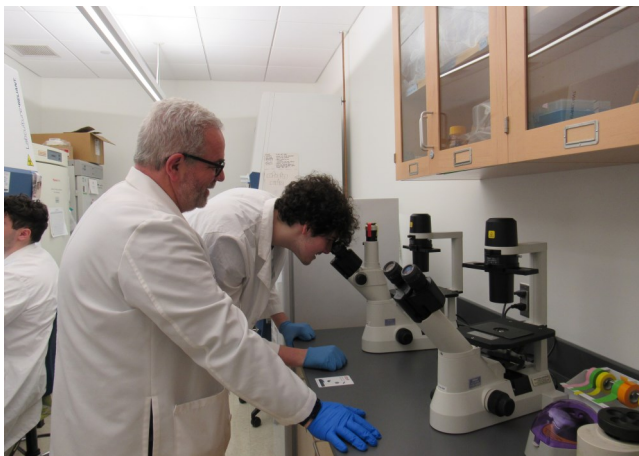


ICUNJ Poster Session: Michael Catalfumo and Alex Kalina

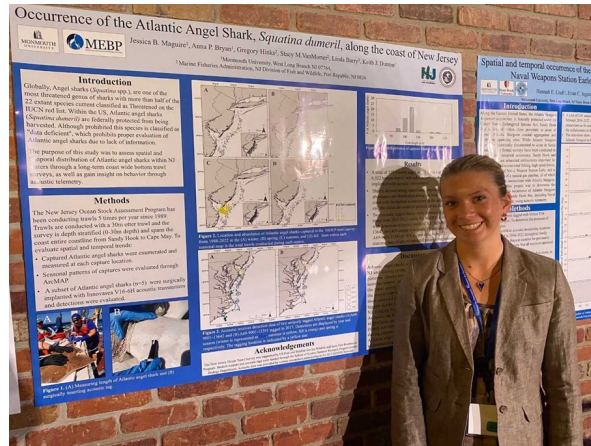
Student Research, continued

Honor Society, Beta Beta Beta, and will be presenting her work at the Tribeta Northeast District Convention at Penn State Schuylkill in April. Noa feels that the best part of her work was getting results after months of trial and error, and she commented, "I never knew going into research how much time it took to get every little result, but when you do, it's the best feeling." She is hoping to continue her education in either research or medicine. Dianelys' poster was on a similar topic – the effect of cypress essential oil on normal fibroblasts and fibrosarcoma cells. Dianelys, who also has been working on the project since Fall 2021, is currently preparing to graduate this May and hopes to continue her education in professional school in healthcare.

Three students also had posters accepted to present at the Independent College Fund of New Jersey research symposium later in March. Alexander Kalina, a sophomore Biology/Molecular Cell Physiology major, was awarded a research grant from ICFNJ for his project on nutraceuticals and inflammation working under the direction of Dr. Jeff Weisburg. Nutraceuticals are foods that have medicinal functions and have been shown to prevent and kill cancerous cells and inhibit inflammation. A vital transcription factor for inflammation activation is NF- κ B, which if continuously activated can lead to chronic inflammation,



Sophomore Alex Kalina working in the tissue culture room with mentor Dr. Jeff Weisburg



Jessie Maguire presenting her work in Asbury Park

and anti-apoptosis (a cellular event which prevents cellular death leading to cancer development), and metastasis (spreading of cancer to other parts of the body). Alexander is working to investigate whether the components from apple extract and pomegranate juice extract are able to limit and inactivate NF- κ B in oral cancer cells. Alexander and Dr. Weisburg are also hoping to see if they could reduce inflammatory signaling levels as compared to normal cells of the oral cavity by quantifying critical pro-inflammatory molecules, such as IL-6 and IL-1 β , which can be activated by NF- κ B. Sophomore Michael Catalfumo also received a research grant from ICFNJ for his project in the laboratory of

Dr. Dottie Lobo, to quantify the effects of hypoxia on stress signaling in fibrosarcoma cells and normal fibroblasts. Hypoxia is characterized as a state in which tissues become oxygen deprived. Under hypoxic conditions, proteins called Hypoxia-Inducible Factors (HIFs) become activated to turn on the expression of

important genes, including the production of new blood vessel networks. The goals of this project are to see if a hypoxic state can be produced using cobalt chloride in normal and fibrosarcoma cells, and to quantify the resulting effects on proliferation and the expression of signaling proteins.

A third student from Monmouth, Jessica Maguire will also be presenting work under the direction of Dr. Keith Dunton at ICFNJ, and Jessica also had the opportunity to present her project at the Mid-Atlantic Chapter of the American Fisheries Society Meeting this fall in Asbury Park, NJ. She started doing research as a freshman in Dr. Sterrett's BY 109 course, and approached him about his herpetology projects. Subsequently, she applied to Dr. Dunton's position for the Summer Research Program, and found herself tagging sharks on the beach in Cape May, and just cannot wait to get out on the R/V Heidi Lynn to do hands-on work. She is also hoping to continue research through graduate school, and sees herself earning a Ph.D. and working as a professor in the future.

Biology Faculty take advantage of Professional Development Opportunities

During the Fall 2023 semester, several Biology faculty members took advantage of opportunities offered by Monmouth University to explore teaching methods. Dr. Karen Pesce and Dr. Sean Sterrett completed the “Effective Teaching Practices” course offered by the Association of College and University Educators (ACUE). This is a 25-week intensive course on evidence-based teaching practices. The goal of the course is to improve student achievement and close equity gaps through focusing on four competencies: active learning, creating an inclusive and supportive learning environment, inspiring inquiry and preparing lifelong learners, and designing learner-centered and equitable courses.

A second group of faculty members took a certificate course in “Inclusive STEM Teaching” which was offered to School of Science faculty through a University grant that was received by the School of Science to provide for innovative teaching modifications. The grant was written by the School of Science Diversity and Inclusion Committee (Drs. Duckett, Gallagher, Lewis, and Sterrett) to offer opportunities for science faculty to improve teaching. Participants completed an intensive on-line course, including multiple discussion sections on Zoom. The moderator of the course, Dr. Linden Higgins (University of Vermont), was very experienced in teaching techniques, with extensive research on effective teaching, including using active learning and formative assessments. At the conclusion of the course, Dr. Higgins came to the University to give a presentation on curriculum design and assessment, and to individually meet with faculty about their specific course challenges. Biology faculty who completed this course include: Drs. Jason Adolf, Maddie Balman, Ped Daneshgar, Bernadette Dunphy, Dennis Gemmell, Dottie Lobo, Sean Sterrett, and Jeff Weisburg.



Newly Formed STEM Up Club Supports Students of Color in Science

STEM Up Students of Color! is an organization founded by students in the School of Science at Monmouth University who are looking to build a safe space and community for students of color pursuing science, technology, engineering and mathematics careers. The goal of the group is to uplift, motivate, encourage and amplify minority voices on this campus, while also guiding them and providing multiple professional opportunities to them. The club hopes to bring in guest speakers who can speak on their experiences in the academic and professional world as well as serve the community around Monmouth University. The club provides leadership opportunities for the students and incorporates opportunities for students to get involved through hands on study sessions or presentation practice. This will not only ensure academic success, but also encourage students to be more extroverted and comfortable in their future professional careers.

STEM UP Officers

President: Dianelys Garcia
 Vice President: Maria Hernandez
 Secretary: Jacqueline Aquino
 Treasurer: Michael Catalfumo
 Social Media Chair:
 Yahira Guevara
 Event Co-Chairs: Sharon Lojano
 and Alejandra Marte de Aza
 Academics Chair: Cielo Marrero

 Advisors: Dr. Karen Pesce and
 Dr. Sandra Zak

Biology Student Leaders Across Campus

Biology students tend to be very busy, as the major demands multiple science courses, almost all of them with laboratory sessions that keep them around Edison Hall quite a bit. However, if you want to get something done, usually you have to give the task to a busy person! So, Biology majors also often keep themselves busy in other adventures as well (including athletics, work, and clubs). This year, several Biology majors are finding themselves in positions of leadership in student government, including class offices and student activities board.

Freshmen Biology major Gillian Sepp is currently the Festivals Chair for the Student Activities E-Board. Gillian commented that she joined SAB to become involved on campus, and by November, she was applying for this Chair position. She keeps on top of the workload by designating specific time each day to do schoolwork, and then catching up more on the weekends. In her role, Gillian gets to set up for events, and then enjoys watching her peers benefit from her work in the background. Time management is a challenge. Gillian explained, "Being on the E-Board of SAB takes significant dedication, especially regarding time. We have a

"I wanted insight but more importantly a direct hand into the decisions that get made regarding the well-being and student-life of both me and my peers on campus." - Hridmita Hasan

General Member meeting and E-Board meeting weekly, and hold 2 office hours per week, along with our weekly events that we organize, setup, staff, and clean up. Sometimes it is challenging to dedicate so many hours to SAB, but is its always worth it." First-year student Hridmita Hasan has also been spending many hours working as a Senator this year, and she has recently been given the job of Homecoming Chair for next fall. She commented that she has always been interested in assessing and fixing problem, and that SGA has provided a collaborative community that has given her social and cultural experiences to complement her studies in biological and physical sciences – all of which are important for her future career in medicine. She commented, " Often times, in school I would hear many students complain about things they were unhappy

with that they wish they could change; the best way to implement any change at all is getting involved. I joined SGA because I think that being involved in the communities that I am a part of is very important. I wanted insight but more importantly a direct hand into the decisions that get made regarding the well-being and student-life of both me and my peers on campus." Hridmita has found that working this position has been a commitment, and she has been careful to not "over-commit" in all of her activities – she wants to be sure that she keeps her priorities straight and fulfills all of the work that is required. It takes organization, as she quips, "I wouldn't be able to survive without my planner."

There are also two Biology majors who are Senior Class Officers. Dianelys Garcia is the Treasurer for the Class of 2023, while Elisa Ramos is the Vice President. Dianelys became involved in student government because she wanted to represent the ideas of her classmates' and make their voices heard. To balance her classwork, she has to be diligent about doing schoolwork each night, even if this means starting to study work or on assignments

early. Similarly, Elisa, sometimes gets a little overwhelmed with the workload. She stated, "I can't lie and say I didn't have to give things up. I did have to pass on my president positions for two organizations, but I know I can stay involved in them, be a senior, and still get all my work done. I reorganized my schedules to be successful in class and after as an officer." Elisa has been involved in many different types of clubs on campus, so that she can fully participate in the Monmouth community. As a senior class officer, she comments that she can, "be hands on in not only making my senior experience memorable but others as well". She credits her friends with giving her the confidence and motivation to apply for the position, and she has no regrets about how she has spent her final year here at Monmouth.



Dianelys Garcia and Elisa Ramos hanging around the labs.

All of these student leaders are having a positive impact on the Monmouth University community, while enjoying the impact of their work on campus. Each of these students is enthusiastic about encouraging their classmates to follow in their path and contribute to campus life, and all feel that the benefits of these leadership positions extend well beyond their time at MU, and will help them in their future careers. Gillian, who hopes to possibly conduct research or work in a laboratory setting noted, "Though SAB does not necessarily relate to biology, it helps me build essential skills that can be applied to my future career." We look forward to seeing our Biology student leaders throughout the campus!

Experiential Education Spotlight

“A strong mental mind frame is something to consider when getting into surgical specialties.”

Zuhaib Malik: Podiatric Medicine

Zuhaib is fulfilling his Experiential Education internship at Ridge Foot & Ankle, which is located in Lyndhurst, NJ. He chose this experience because he would like to apply to podiatric medical schools in the near future, and was made aware of the position through a relative who was a student in the physician’s residency program. Zuhaib felt that it was important for him to see what a typical day looks like in this field before making a commitment to this career. As for his experience, he commented, “I love the environment and learning so much in the few months I’ve been here so far!” He feels that the most helpful part of the experience has been the step-by-step guidance of each patient encounter given to him by the physician. He has been gaining a thorough understanding of what is being performed, and the purpose of each treatment. The most difficult part of his experience has been witnessing some severe foot injuries – he comments, “A strong mental mind frame is definitely



surgical specialties!” Despite these encounters, he feels that the experience has propelled him even further towards the specialty of podiatric medicine. Zuhaib advises students who are looking to complete ExEd to shadow in multiple fields, as he comments, “I started off last year shadowing multiple physicians in completely different specialties before I knew podiatry would be the one for me!”

Steven Barsoum: Cardiology

Steven Barsoum is fulfilling his ExEd experience this semester by working with cardiologist Dr. Rakesh Passi at Hackensack Meridian Health. He initially chose this position because he wanted to start to gain some experience, but he quickly



found that the work was more exciting than he anticipated. He commented, “Upon working there, I became deeply intrigued with everything we were doing, such as the scans we performed and the cardiac testing we did along with seeing patients and helping solve their problems or concerns. The doctor is very hands-on and is constantly teaching me new things, such as what to listen for when using the stethoscope, how to read an EKG report, and more. This held my interest and kept me more excited about going to work for him every day.” He has been able to make a lot of connections with patients, pharmaceutical representatives, and other physicians, and has been immersed in hands-on learning about the field of cardiology. The learning curve of the position has been his biggest challenge, from learning the medicines, to the office procedures, to the computer program for patient records. Despite these challenges, Steven is leaning towards specializing in cardiology. For students seeking an ExEd experience, Steven’s advice is to proactively chase the position you want, “Reach out, show interest, and then, if you are hired, work hard every day and never waste a moment when you are there because every moment can be a teachable moment.”

TriBeta Honor Society

Beta Beta Beta Biology Honor Society Officers:

Elisa Ramos, President

Emily Olynyk, Vice-President

Nina Corpora, Secretary

Hannah MacDonald, Treasurer

Dianelys Garcia, Historian.

Faculty Advisor: Dr. Dennis Rhoads



New Full Members:

Jeffrey Brewer
Trinity Ariel Caratenuto
Alexa K Houseknecht
Dayana Khalil
Nico Landino
Julianna Noel Mavica
Christopher Meehan
Erin N. Oscar
Julia Panebianco
Madison Patterson

New Associate Members:

Hridmita Hasan
Julia Rice
Carly Torsiello
Sarah Vladu

*The Chi Eta Chapter at
Monmouth University is one of
262 Chapters of the Society in
the U.S. and Puerto Rico*

Adjunct Spotlight: Professor Laurie Rozzo

Professor Laurie Rozzo started at Monmouth University in 2011, and has been teaching Human Biology (BY 104) and Introduction to Cell and Molecular Biology (BY 110). Years prior to Covid, Professor Rozzo offered the first on-line course in the School of Science, and was quick to jump in to offer assistance to faculty in the Department who never experienced on-line teaching. In her own words:

Why did you come to Monmouth?

I knew about the excellent reputation Monmouth had, as well as the beautiful campus and location.

What influenced your decision to become a teacher?

My time as a TA and instructor in graduate school influenced me. While teaching the course, I enjoyed the interaction with students and knew that it was something that I wanted to pursue.

What is your favorite topic to teach at Monmouth and why?

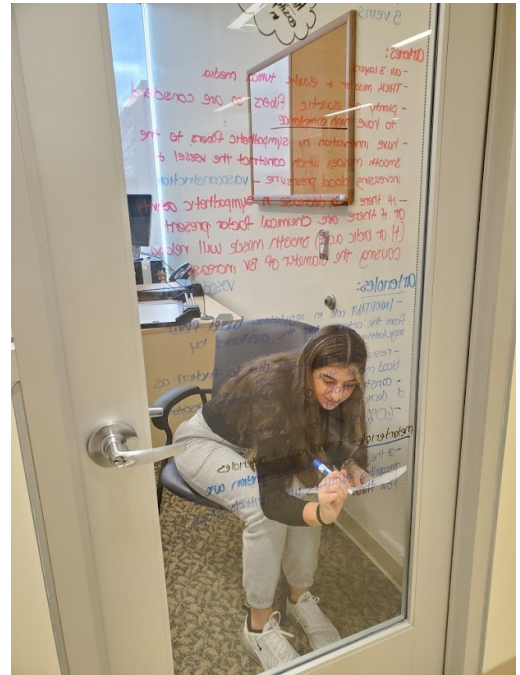
My favorite topic to teach would be how macromolecules are digested. I enjoy it because the students can directly connect with the food they eat and how the body processes it.



Welcome to our Office Coordinator: Sue Tomo

Welcome to Sue Tomo as our new Office Coordinator for the Biology Department! Sue can be found in the Department office, in Edison 382. Sue joined us this past October after working in the Accounting first as a collector and then as a cashier since April 1995. In her spare time, she loves to bake, cook, and spend time with her two son's and their families. She especially enjoys her two grandchildren, Lucky and Gunner, and her fur grandbaby "Stanley". Welcome Sue!





Lab Safety Corner

Spring is in the air and the weather is warming up. Soon many of you ladies will be wearing those cute shorts/shirts and strappy sandals and you guys will be sporting shorts and a tee. But remember it is important to be properly dressed when working in the laboratory. On hot summer days, bring a pair of long pants and closed toes shoes to the lab and change into them when you get there! Lab coats are utmost important and must be worn in the lab no matter what the experiment.



**LAB COATS...LAB COATS...LAB COATS!!
& NO FOOD OR DRINK IN THE LABS!**



Biology Faculty Publications 2022 –2023

*Monmouth Student Authors

Adolf, J. E., Saldutti, K., ***Conlon, E.**, Ernst, E., Heddendorf, B., Shifren, S., & Schuster, R. (2022). *Nitrogen-limited Cyanobacterial Harmful Algal Blooms in Deal Lake, New Jersey* (Vol. 9, Issue 57). <http://www.eaglehill.us/urna>.

Adolf, J. E., Weisburg, J., ***Hanna, K.**, & ***Lohnes, V.** (2023). *Enterococcus* exceedances related to environmental variability at New Jersey ocean beaches. *Environmental Monitoring and Assessment*, 195(1). <https://doi.org/10.1007/s10661-022-10788-0>

***Craft, H.E.**, G. Fouad and **S.C. Sterrett**. *In press*. Statewide prioritization of vernal pools for pond-breeding amphibians in New Jersey. *Journal of Environmental Management*.

***Haydt, N.T.**, D.J. Hocking and **S.C Sterrett**. 2022. Spatial capture-recapture derived turtle capture probabilities and densities in the Chesapeake and Ohio Canal. *Journal of Herpetology* 56(2):203-210. <https://doi.org/10.1670/21-026>

***Lucas, S. N.**, Fouad, G., & **Adolf, J. E.** (2023). Spatially distributed water quality responses to freshwater discharge in a tropical estuary, Hilo Bay, Hawai'i. *Environmental Monitoring and Assessment*, 195(3), 428. <https://doi.org/10.1007/s10661-023-11006-1>

Tiedemann, J. 2022. A History of Cows: The Biggest Striped Bass on Record. *The Fisherman Magazine*. Volume 50, Issue 2: February 2022.

Tiedemann, J. 2022. Why 9%? Striped Bass Catch and Release Mortality: Putting Release Mortality Rates on Stripers into Scientific Perspective. *The Fisherman Magazine*. Volume 50, Issue 5: May 2022.

Tiedemann, J. 2022. Will They or Won't They? What Does the Future Hold for Sand Eels in the Striper Surf? *The Fisherman Magazine*. Volume 50, Issue 34: November 2022.

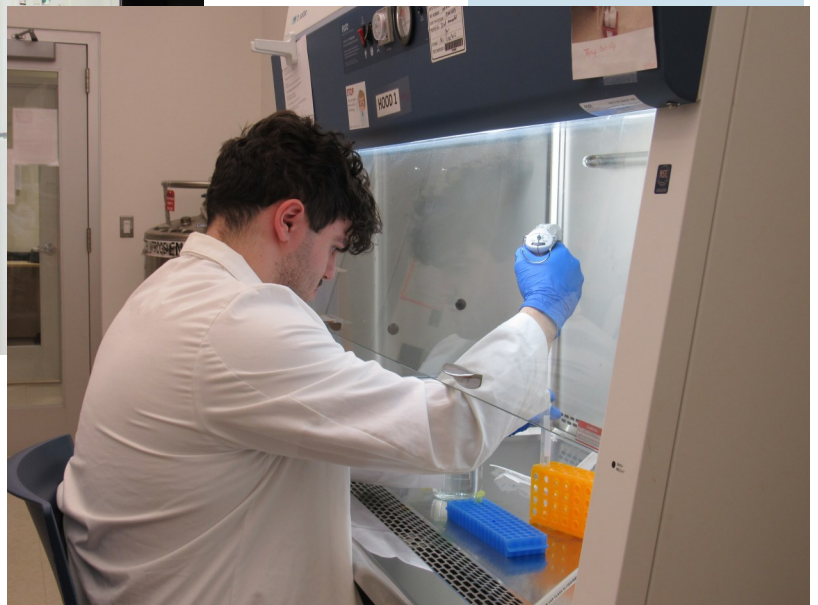
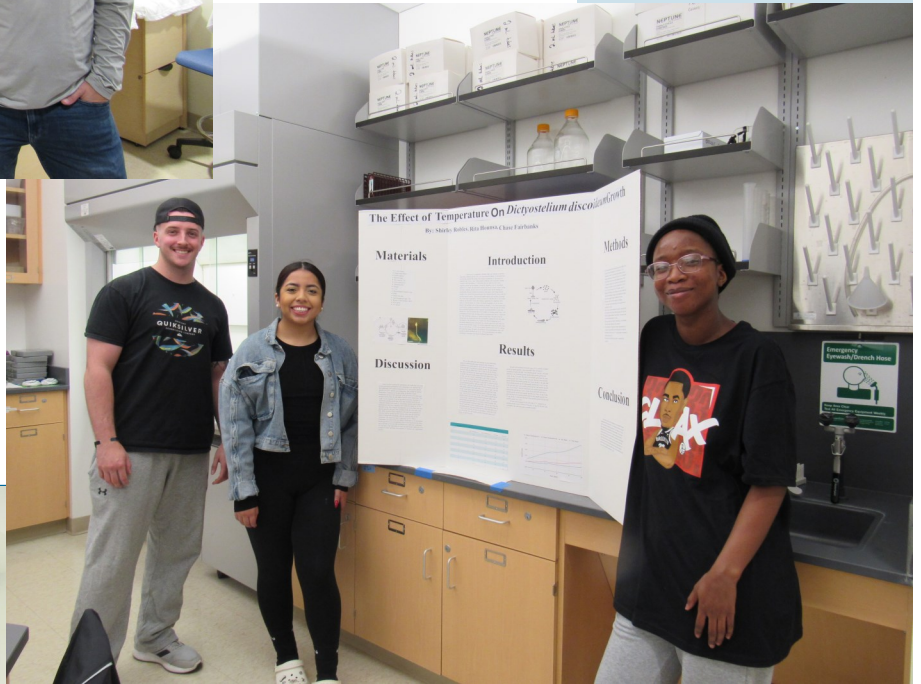
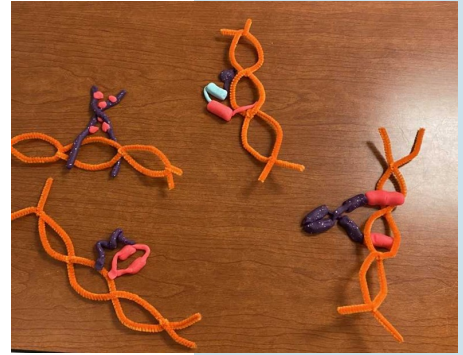
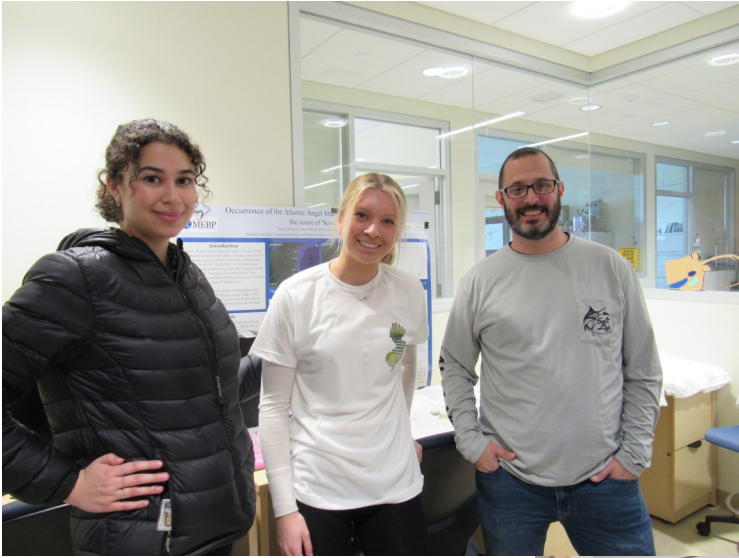
Tiedemann, J. 2023. Improving C & R Success: Being a Fish Out of Water is Tough. *The Fisherman Magazine*. Volume 51, Issue 4. April 2023.

Sterrett, S. C. T. Dubreuil, M. O'Donnell, A. Brand, E.H.C. Grant. 2022. Testing assumptions in the use of PIT tags to study movement of *Plethodon* salamanders. *Journal of Herpetology* 56(2):146-152. <https://doi.org/10.1670/20-006>

Sterrett, S., A.H. Roy, P. Hazelton, B. Swartz, E. Nedeau, J. Carmignani, and A. Skorupa. 2022. Standard Operating Protocol for Mark and Recapture Monitoring of Brook Floater in Streams. U.S. Department of Interior, Fish and Wildlife Service, Cooperator Science Series FWS/CSS-142-2022, Washington, D. C. <https://doi.org/10.3996/css67282137>.




Biology Faculty, Staff, and Students collected three trunk loads of medical supplies and toiletry items for the people of Ukraine in last April.




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