

Fall 2023

Welcome to the Extension Team Dr. Roy Messaros



Dr. Roy Messaros has joined the New Jersey Sea Grant Consortium Extension staff as the Water Resources Agent. As a Senior Research Project Manager, Dr. Messaros has 20 years of experience and a great passion for water resources, hydrologic and hydraulic analysis, wetlands for water quality improvement, limnology, and all things relating to ecosystem resilience and coastal engineering. He has a doctorate in Civil/ Coastal Engineering from Stevens Institute of Technology and an M.A. and B.S. in Biological Sciences from William Paterson University. His unique background and expertise across a variety of disciplines and services, both in engineering and science, allows him to bring a truly comprehensive approach to the Water Resources Program.

Dr. Messaros's professional experience and expertise include hydraulic and hydrologic modeling, design, and construction for flood risk

management, FEMA inundation mapping and certification, coastal storm surge protection, and wetland restoration/mitigation projects. Beneficial reuse of dredge material for tidal marsh restoration efforts has also been part of his wetland restoration experience. Other project experience includes design of erosion control measures, stream bank restoration, levee inspections, and modeling hydraulic structure failure modes.





Dr. Roy Messaros with students studying wetland design and watershed remodeling.

Prior to joining Dr. Chris Opropta's Water Resources Program at Rutgers University in 2023, Dr. Messaros was employed at the U.S. Army Corps of Engineers (USACE) New York District, overseeing the implementation of many large-scale projects involving flood and coastal risk management; marsh and wetland restoration; beach erosion control; and feasibility studies.

Dr. Messaros has extensive teaching experience serving as an adjunct professor at New York University Tandon School of Engineering and Stevens Institute of Technology, instructing both undergraduate and graduate level courses. He is particularly skilled at conveying complex ideas and concepts related to hydrology, watershed modeling, watershed resources engineering, and wetland design, among others. His applied experience at the USACE and in teaching provides a useful combination of knowledge of complex, technical concepts and the ability to share it with others through guidance and mentorship.

KNAUSS NEWS

An Interview with Oluwafemi Soetan Knauss Fellowship recipient

Tell me a little about yourself!

My name is Oluwafemi Soetan and I am a Ph.D. candidate at Montclair State University where I am studying how anthropogenic and biogeochemical factors affect an aquatic ecosystem and the impact of remedial sediment dredging on polluted rivers, under the supervision of Dr. Huan Feng. Before starting my Ph.D., I completed a Master's degree in Water and Wastewater Engineering at Cranfield University in the UK. I am from Nigeria in West Africa and it was there that I earned my bachelor's degree in Biochemistry.

Why did you decide to apply? What drove your interest in the Knauss program?

I am very passionate about Environmental Management and I think that it is crucial that scientists and other environmental stakeholders (communities, government, NGOs, private organizations) appreciate the nexus between research and policymaking especially as it relates to the protection, regulation, and preservation of environmental resources. This is why I applied for the Knauss fellowship, after years of working in environmental research, I have come to realize how much the policymaking process impacts my work. Most of the recommendations, challenges, and barriers that I highlight in my study can only be addressed from a policy standpoint. As a young researcher, I believe that this experience will give me a robust and holistic view of the whole process from research to scientific recommendations to community engagement to policy development and implementation.

also get down to learning and applying some of my experience. However, for now, I am working hard on concluding my Ph.D. program by completing the needed research components and putting together my Doctoral thesis.

Can you give us any details on what you might be doing as an executive fellow? What do you hope to learn and gain from this experience?

I will be working as an Aquaculture Policy Fellow with the NOAA Fisheries Office of Aquaculture. Some of the responsibilities I will be encountering include providing support for the implementation of initiatives that enable efficient regulatory processes and the development of sustainable marine aquaculture, evaluation of policies, legislations, and regulations, advising federal agency partners and stakeholders, and provide support for the coordination and planning of outreach activities with stakeholders and partners to advance Aquaculture Program objectives.

Do you have any future plans or ambitions following the Knauss Fellowship?

Absolutely! The Knauss Fellowship is for me, a springboard to pursuing a career in environmental governance and policy making. I hope to be very much involved in the formulation and review of regulations and policies that impact aquatic environments, resources, and the communities they serve. I believe that I am taking the right step in the direction of this ambition and I am certain that the experience of this fellowship year will empower me for this career pursuit.

How did your education and research experience help with the application process?

The Knauss fellowship has clear requirements that level the selection playing field. Contrary to my earlier assumptions before submitting my application, the fellowship does not necessarily evaluate who you are on paper (grades and transcripts) but rather asks probing questions that provide the selection panel with clear access to your life experiences, the events and situations that have 'formed' you and the motives that drive your passion in environmental management and policymaking. I would say that my diverse education experience, the relevance of my research interests to the missions of the Sea Grant program, and my prior investments in extracurricular leadership were significant components that helped me submit a competitive application.

How are you preparing for this unique experience?

I am very excited for the year ahead and can't wait for February to come. It would be great to meet with colleagues in the Oluwafemi Soetan group and



Oluwafemi Soetan in the field and presenting.



EDUCATION at NJSGC

Welcome to the Education Team Alaina Perdon K-12 Program Coordinator



Though a New Jersey native, Alaina Perdon spent the last five years living, learning, and working on the Eastern Shore of Maryland. In May 2022, she graduated from Washington College, where she majored in environmental studies with minors in anthropology and Chesapeake Regional Studies. Post-grad, she taught ecology and local history to students across the Chesapeake Bay watershed aboard a fleet of historic Chesapeake workboats.

This fall, Alaina returned to the Jersey Shore to continue teaching, in hopes of inspiring an appreciation of the landscape in which she grew up. Barnegat Bay served as the backdrop for all her best childhood memories, and her desire to work in the environmental realm undoubtedly started as a kid while romping through the salt marsh – as well as going on a third-grade field trip to NJSGC at Sandy Hook where she got to feel like a real environmental scientist for a day.

Alaina attended high school at the Marine Academy of Technology and Environmental Science in Manahawkin. Throughout her education and early career she had the privilege of exploring the many facets of "environmental work," from tracking *Staphylococcus* bacteria at local beaches to teaching preschoolers how to paint with crushed flower petals.

"I've found my passion lies in education and relish the opportunity to teach anyone I meet about how we interact with our environment. I'm honored to take on the role of K-12 Program Coordinator to continue connecting children to their landscape and creating new experiences in the outdoors," says Alaina.

Since starting her new position November I, she's already had the opportunity to jump into teaching, attending a number of in-school programs to show Monmouth County students the wonders of beach sand, horseshoe crabs, and diamondback terrapins. Presently, she's working to compile resources for our educators to enhance our field trip programs.

Outside of work, she spends most of her time outdoors, but on rainy days, she will be found reading, crocheting, or tending to her ever-struggling houseplants.

LIVE, NJSGC Virtual Learning Programs

Travel through the internet to the coast and learn in-depth about New Jersey's marine and coastal ecosystems in an intimate, small group setting. Taught by experienced environmental education staff LIVE, NJSGC offers a variety of opportunities to engage students, scouts, and learners of all ages. Energetic presentations, include live animals, games, science experiments, and encourage student interaction to spark their curiosity on topics that are designed to meet educators' curricular needs, scout requirements or families' interests.

Other interested groups, clubs, or families are welcome to reserve any of the programs NJSGC provides. All virtual K-12 Programs support New Jersey Student Learning Standards and can be modified for age-appropriateness and learning abilities. Programs are 45-60 minutes per class and can be adjusted to fit class schedules. Choose from Sharks Verses Rip Currents, Coastal Ecosystems, Magnifying Plastics, Terrific Terrapins, or Save Our Troubled Ocean.Visit <u>https://njseagrant. org/virtual-learning-programs-at-njsgc/</u>

Every Kid Outdoors

Explore Sandy Hook from the classroom or in person with Every Kid Outdoors Grant Funded Program – FREE to 3rd 4th and 5th Graders! Whether students are in class or learning from home, this program can enhance their educational experience and support school curriculum.



For more than 30 years, school groups from New Jersey and neighboring states have enjoyed learning about coastal ecosystems with New Jersey Sea Grant Consortium (NJSGC) at Sandy Hook, a unit of Gateway National Recreation Area with our field trip program. NJSGC is proud to partner with the National Park Service and Jamaica Bay-Rockaway Parks Conservancy to offer FREE programs to 3rd 4th and 5th grade students with Every Kid Outdoors Grant Funded Program for the 2023-2024 school year. Educators can choose to book field trips with us or have an in-school program scheduled at no cost to your school or center.Visit https:// njseagrant.org/every-kid-outdoors-program-for-4th-grade/

Oceans To Go!

The Education Program at New Jersey Sea Grant Consortium offers marine science programs for schools or community centers for a fee during November through March. Most Oceans to Go! programs are appropriate for grades K-6.All programs offered include "hands-on" projects, and all supplies for activities at no additional cost. Many topics include live marine animals. NJSGC can accommodate the school day schedule or after-school schedule or evening family science at night program. To find out more about our Oceans To Go! program, and for a complete list of topics, visit <u>https://njseagrant.org/education/ oceans-to-go/</u>



NJSGC Educators Mindy Voss and Jody Sackett Present Microplastics Program at The Alliance for New Jersey Environmental Education Winter Research Symposium & Conference at TCNJ



Microplastics are dangerous tiny bits of polymer that pervade our environment. They're found everywhere from the Arctic to inside our own bodies. These plastics, which derive either from direct

JODY SACKETT MINDY VOSS

manufacturing or from the breakdown of larger plastic items like water bottles and containers, are washed into the ocean where they impact marine life throughout the world. The Alliance for NJ Environmental Educators (ANJEE) held its annual Winter Conference on January 11-12 at The College of New Jersey, and a proposal by NJSGC educators Mindy Voss and Jody Sackett was selected for presentation at this prestigious conference. Geared towards formal and non-formal educators, "Navigating Microplastic Pollution and Solutions" engaged conference participants using interactive activities to demonstrate the properties and persistence of microplastics in the marine environment.

Microplastics are small pieces of plastic, 5mm or less in diameter, and are generated in several ways. Polyethylene microbeads were "born" as microplastics for use in toothpastes, facial scrubs and many other personal-care products. Nurdles are recycled plastics processed into rods and cut into small bits. These are ubiquitous in the ocean because many water-treatment facilities are unable to filter the tiny pieces out, and they persist in the environment for many years. Conference participants had the opportunity to microscopically examine microbeads and nurdles to become more familiar with their appearance and identification. Microplastics also result from plastic "dust" generated by construction or industrial processes and are carried to the ocean by wind or water. In addition, large plastic objects like water bottles or containers break down into smaller and smaller pieces due to ocean wave action, heat, and sunlight,

which weaken the structure and reduce it into microplastic-size fragments that take centuries to biodegrade. NJSCG educators demonstrated sifting activity for participants to detect "hidden" polymers.

For recycling purposes, consumer plastics are categorized into 6 primary types based on polymer source. These polymers have varying densities which result in different characteristics; some types float, some degrade in heat, wind, or sunlight, and some are more durable. The NJSGC team used a "Sink or Float" activity to identify types of polymers and determine whether they can be recycled.

Plastics affect marine life in various ways. Marine animals can get caught in plastic netting or trapped in consumer product debris, decreasing mobility and function. Since plastics are found in the benthos and throughout the water column, it is difficult to avoid consuming plastic. Ingesting plastics leads to blocked digestive systems, resulting in malnutrition and starvation. Ocean toxins such as mercury and PCBs adsorb and bind to plastics, increasing the toxic effect when ingested, and can even impact fertility.

Various solutions to reducing microplastics are available, and NISGC educators demonstrated how to evaluate their effectiveness. While recycling discarded plastics into other polymer items such as insulation, furniture, and clothing is an option, it's not always effective since consumer recycling rates are typically very low. Reducing demand for single-use plastic items like water bottles, containers, and bags can be more effective in the long run, since it changes consumer behavior. Creative engineering and chemical solutions are being developed to remove plastics directly from the water, or to reformulate polymers for faster degradation. Legislation to eliminate routine use of single-use plastics like grocery bags, foam containers, and straws has proved effective. And education in schools, colleges, and through environmental groups helps by promoting awareness of the problem, and advocating solutions that inspire responsibility and stewardship for the environment and the ocean.

NJSGC in YOUR COMMUNITY

Congratulations to Dr. Michael Acquafredda



Dr. Michael Acquafredda has been elected President of the Mid-Atlantic Chapter of the American Fisheries Society for 2024.

Previous Knauss fellow and current NJSGC Extension Agent, Dr. Acquafredda hosted a NJ Aquaculture Growers Forum at the Jacques Cousteau National Estuarine Research Reserve featuring 2022 Knauss Fellow Janine Barr, who presented her research on oyster farm filtration and her calculator tool for growers.

Desktop Calendars Available on NJSGC Website

Download these beautiful screen saver calendars for each month of 2024! They feature the winners from the recent photo contest. Visit <u>https://njseagrant.org/desktop-calendars/</u>



Mark Your Calendars OCEAN FUN DAYS COMING UP

May 18, 2024 Island Beach State Park, Seaside Park

May 19, 2024 NJ Sea Grant Consortium Sandy Hook





