

Spring 2023 State of the Shore Media Event Reports Good News for New Jersey's Beaches

NJSGC held its annual media event on May 25 in Asbury Park. Dr. Jon Miller delivered his annual State of the Shore Report. NJDEP Commissioner Shawn La Tourette, Dr. Peter Rowe, and Dr. Tom Herrington delivered remarks as well.

While it's obvious that the locals and tourists of New Jersey are ready for this summer, the question remains: Are our beaches? Well, according to our State of the Shore Report they most certainly are! Our beaches are in good condition after a few relatively mild winters in a row. Not to mention that New Jersey has taken steps to improve resilience, including developing a statewide coastal resilience strategy, creating buyout programs and elevation solutions, and embracing living shorelines and other natural infrastructure.

In terms of coastal flooding, erosion, and wave activity, this winter was relatively uneventful. However, two large storms made quite the splashes in our home state. Although no longer a Category 5 by the time it reached New Jersey, Hurricane lan caused billions of dollars in damages and created some of the largest inpacts of the season. During a Spring tide in December, a storm caused water measured by a tide gauge at Sandy Hook to reach their highest levels since Hurricane Sandy.

The summer forecast is a bit more complicated and comes with a high level of uncertainty based on developing El Niño conditions and unusually warm surface water in the Atlantic



Basin, which can both increase the likelihood of formation and the intensity of hurricanes.We will have to wait and see how the Summer season progresses, so please remember to be safe and prepared when it comes to the coast. Read more in this year's by visiting our website: https://njseagrant.org/wpcontent/uploads/2023/05/Sos-Report-Single-Pages.pdf



Dr. Jon Miller was interviewed by NBC News.



From right to left: Dr. Tom Herrington Coastal Community Resilience Specialist, Dr. Peter Rowe NJSGC Executive Director, NJ DEP Commissioner Shawn LaTourette, and Dr. Jon Miller Coastal Processes Specialist.



Media at State of the Shore.

NJSGC on the Move

NJSGC Staff Tours Naval Weapon Station Earle with the New Jersey Coastal Resilience Collaborative

On Friday June 9th, staff members from New Jersey Sea Grant Consortium toured Naval Weapon Station Earle as part of the New Jersey Coastal Resilience Collaborative's (NJCRC) Technical Assistance Coffee Chat Field Trip Series. The New Jersey Coastal Resilience Collaborative (NJCRC) is a collaborative working to establish sustainable and resilient coastal communities and ecosystems.



Figure 1. The view overlooking the facility, with Sandy Hook in the far left corner and the wave tank on the right)

The work of the Department of **Figure I** Defense, alongside local groups and **wave tau** community members is achieved through building partnerships with experts, raising community awareness, and providing accessible education and training.

The Navy Base's Waterfront is located in Leonardo, NJ and hosts one of the biggest oil spill simulators in the world (see Figure 1). The tour began with a close look at the Ohmsett facility, also known as the National Oil Spill Response & Renewable Energy Test Facility, located in Leonardo, New Jersey. The name Ohmsett is an acronym for "Oil and Hazardous Materials Simulated Environmental Test Tank". When activated, the tank creates wave simulations like the ones pictured in Figure 3. What makes the wave tank located here unique is how closely it can simulate real life conditions due to Earle's tank being located outside, with access to sun, wind, and different weather temperatures. This is where oil spill simulations are conducted, by testing the efficacy of different machinery and biological agents on their ability to clean up or biodegrade oil.

The next part of the tour took NJSGC underneath the massive wave pool, where a coastal restoration project is taking place. This project is led by Meredith Comi, a member of NY/NJ Baykeeper, who is pioneering oyster restoration in the Raritan Bay. Restoring New Jersey's oyster population can help protect the shoreline from erosion and storms, help filter the water, and help add a habitat for marine life. Naval Weapons Station Earle has a long history in New Jersey, and it is interesting to see the current and important projects taking place on this site! This site overlooks the Atlantic Ocean and displays a gorgeous view of New York City.



Figure 2. Representing the New Jersey Sea Grant Consortium was Director of Education Diana Burich, Communications Intern Catherine Barone, Scout Program Coordinator Jodie Sackett, College & Special Programs Coordinator Rosemary Higgins, and Education Specialist Mindy Voss

Figure 3 The tank simulating waves



SGC On the Move

Funded by the National Science Foundation (NSF), People on the Move in a Changing Climate (PEMOCC) is a Sea Grantled Research Coordination Network that addresses research needs related to climate-induced human mobility, its socioeconomic consequences, and its role in building resilience and adaptation to the impacts of climate change in U.S. coastal and Great Lakes regions.



Dr. Peter Rowe, Executive Director of New Jersey Sea Grant Consortium

In April, Dr. Peter Rowe attended the PEMOCC workshop in Anchorage, Alaska. This was the final workshop in a series held across the U.S. Topics in April focused on Alaska, the Pacific Northwest, and Pacific Island regions. This workshop provided case studies of climate induced human mobility across the world, and includes areas where coastal residents are moving away from the coasts and areas where residents are moving towards the coasts.



A diagram of climate change impacts on our coasts

New York - New Jersey Estuary named a Hope Spot

Sylvia Earle's international marine conservation nonprofit, Mission Blue, has declared the New York-New Jersey Harbor Estuary as a Hope Spot. Mission Blue has also declared Dr. Judith S. Weis, Professor Emerita at Rutgers University, and Rob Pirani, Director of NY/NJ Harbor & Estuary Program as the Hope Spot Champions. This is in recognition of their work to connect their community of urbanites with the natural world around them, through continued campaigning for water quality improvement, habitat restoration, and community engagement programs.

Dr. Judith Wiess, NJSGC Stakeholder Advisory Board member, explains: "I had previously thought Hope Spots could only be pristine places, but when Shinnecock Bay, LI was designated, that changed my mind. It had been subject to harmful algal blooms, but was being restored by Ellen Pikitch of Stony Brook and colleagues. After a couple of years, the slowly restored clams were able to filter the water and greatly reduce the HABs. Ellen Pikitch nominated the bay, and it was selected. So, I spent last summer putting together the nomination, documenting the changes, and ended up learning a lot." As an academic, I rate things on the basis of 100% - so if Shinnecock went from a 75-85, our estuary went from a 0 or 10 to a 70! So, I spent last summer putting together the nomination and documenting the changes and learned a lot."



Dr. Syvlia Earle's Announcement naming New York-New Jersey Harbor Estuary as a Hope Spot. Watch the full announcement at https://www.youtube.com/watch?v=QRR QfEGtN0U

Dr. Weiss continues "Now I want the people around the estuary to appreciate how far we have come - not just the scientists studying it, but the people who cross it daily in cars, trains, ferries, who never give a thought to the water below what a treasure it is or how bad it used to be - and appreciate the work of all the government agencies and NGOs who worked hard for many decades to make that happen."

Celebrating 20 Years of Ocean Fun Days: Through Rain and Shine, We Had A Good Time!

New Jersey Sea Grant Consortium celebrated the 20th annual Ocean Fun Days on May 20th and May 21st of this year. Taking place in Island Beach State Park and Sandy Hook, hundreds came to take part in the exhibits and eco-tours Ocean Fun Days had to offer. Our research-led exhibits focused on our oceans, energy conservation, and coastal resilience. Even through the rain, children and adults alike were excited to participate in our crab races, energy scavenger hunt, guided walking tours, and seining for marine life! Even Congressman Frank Pallone, Jr. stopped by our headlining event to observe all the activities taking place! For those unable to attend in person, NJSGC had OceanFunDays.org complete with videos, handouts, activities, and other resources for children.

New Jersey Sea Grant Consortium Executive Director Dr. Pete Rowe expresses his excitement about the 20th anniversary: "I am once again proud to have been a part of such an incredible event. Staff and attendees alike all had a great experience orchestrating Ocean Fun Days and can't wait for next year!"

Rosemary Higgins, College & Special Programs Coordinator at NJSGC, was thrilled about this year's success: "The collective hard work of our sponsors and exhibitors executed the vision we had for our 20th anniversary of Ocean Fun Days. What is so special about this event is the access to free coastal and environmental education, which is provided by our collective of local scientists and researchers. This event is truly unique, and it is inspiring to see how many come every year to learn more about our planet and preserving our coastal resources!"

Whether it was celebrating years of environmental awareness with eco-tours, exhibits, or crab races, the New Jersey Sea Grant Consortium Staff appreciates the excitement brought for the 20th anniversary of Ocean Fun Days!



Kids racing crabs at Ocean Fun Days



Kids proudly showing their tickets to participate in crab racing



Congressman Pallone pictured with New Jersey Sea Grant Consortium's Director of Education Diana Burich



The New Jersey Sea Grant Consortium Staff

NJSGC Research Spotlight

New Jersey Response of Salt Marsh Methane Emissions to Sea Level Rise

The goal of this project is to observe and analyze the greenhouse gas exchange in salt marshes relative to sea level rise, taking note of how plant growth and climate change are impacted through this experiment. The project site and research is being conducted at three different sites along the Mullica River in southern New Jersey.

Salt marshes are known for being "carbon sinks" in the environment that trap greenhouse gasses, like carbon dioxide, and help counteract the impacts of climate change. However, microorganisms living in these ecosystems consume this stored carbon and produce methane, which is 45 times more potent in the atmosphere than carbon dioxide. Therefore, there is growing interest in preservation and restoration efforts of salt marshes

Dr. Charles Shutte is working with students at Rowan University to measure and construct marsh organ platforms. These platforms will be placed at 3 different sites along the Mullica River and will have 25 pipes each to be placed at 3 different sites along the Mullica River. These elevated organs represent 5 different levels relative to predicted sea level rise and are being placed at low, intermediate, and high salinity sites. As sea level rises, salinity and time for marsh plants spent submerged in water will increase as will their functioning in the environment. Once preparation is fully completed, the research team plans to measure the change in methane emissions and concentrations in the soil as well as plant growth in the field.

This research project is being funded by New Jersey Sea Grant Consortium and conducted by Rowan University, Montclair University along with the New Jersey Department of Environmental Protection (NJ-DEP).



Dr. Charles Schutte, Assistant Professor in the Department of Environmental Science at Rowan University, at a study site in the Mullica River estuary.



Rowan University Environmental Science student Adriana Gomez and Montclair State University Earth and Environmental Studies student Ingrid Witty measuring salt marsh elevation at a study site in the Mullica River estuary.



Rowan University Environmental Science student Mary Lipchock measuring PVC pipes to be cut for marsh organ construction.



Rowan University graduate student Sabrina Priya assembling individual PVC pipes into a marsh organ.

NJSGC in Your Community

NJSGC's Michael Danko Presents Environmental Awards at Symposium

Mike Danko, NJSGC's Marine Recreation Agent, continues to represent our organization on New Jersey Southern Junior Science and Humanities Symposium's (NJSJSHS) Executive Board. This year's event was hosted by Ocean County College on February 24, 2023.

The NJSGC provided awards to the Top Environmental Paper and Top Environmental Poster, and the effort from NJSGC members through this process is greatly appreciated. The Top Environmental Paper award was presented to Victoria Yakes, from the Marine Academy of Technology and Environmental Science, for her paper Analysis of Tannin Interference on Enterolert*250 Testing of Enterococcus SPP. The Top Environmental Poster award was presented to Bethany Suliguin, from the Marine Academy of Technology and

Jersey Shore Partnership holds Summer Celebration



The Jersey Shore Partnership held its annual Summer Solstice Celebration. The event is the "unofficial" kickoff to summer at the Jersey Shore, bringing together 500 + corporate leaders, elected officials, non-profits, environmentalists, and academics at a networking party. Samantha Kreisler, Communications Specialist was joined by NJSGC colleagues Diana Burich Education Director, Laura Kerr Coastal Resilience Specialist, Dr. Jon Miller Coastal Processes Specialist, and Dr. Tom Herrington Coastal Community Resilience Specialist. Environmental Science, for her poster on the Utilizing Lemna spp to Quantify Nutrient Uptake and Release as a Potential Phytoremediation strategy for the Barnegat Bay Watershed, New Jersey.

In addition, Victoria Yakes went on to compete in the Environmental Sciences division at the National Junior Science and Humanities Symposium and came in second place for her oral presentation. The 61st National Junior Science and Humanities Symposium was held on April 12-15, 2023, in Virginia Beach, Virginia.

NJSGC Rip Current Awareness in the News



NJSGC Education Specialist Mindy Voss appeared on News 12 New Jersey to remind all beachgoers about the greater importance of ocean safety and rip current awareness.Visit https://fb.watch/lbani1JTGh/ to watch the full video.

Moving faster than an Olympic swimmer, rip currents can transport bathers away from the shore in a matter of seconds. Panic and lack of safe swimming skills are what causes more than 100 people to perish from rip currents in the U.S. each year. Help keep your community safe by reserving an Ocean Hazards and Beach Safety: Sharks vs. Rip Currents program. This hour-long program can take place at your school/center or virtually anywhere via Zoom or Google Meets. For more information contact Mindy Voss, Education Specialist at mvoss@njseagrant.org or 732-872-1300, extension 30.

Coastal Health Initiative Grant Awardees Selected for the 2023 Sandy Hook Partnerships in Coastal Studies Research Opportunity

The three projects observe multiple coastal studies, including biodiversity in living shorelines, hard substrate impacts on benthic infaunal communities, and filth fly's functional biodiversity at wastewater and coastal sites.

Earlier this year, New Jersey Sea Grant Consortium (NJSGC), The National Oceanographic and Atmospheric Administration (NOAA), Fisheries James J. Howard Marine Sciences Lab (Howard Lab), Congressman Frank Pallone, and the Northeast Fisheries Science Center formed a partnership to fund a research project related to New Jersey coastal health. This project would provide a New Jersey college/university faculty member and their trainees/students \$70,000 for a 2-year mission or \$35,000 for a 1-year project.

The teams will work with the NOAA Fisheries Howard Lab and New Jersey Sea Grant Consortium to accelerate our coastal health research and bring novel ideas and solutions to regional challenges in conservation, management, and sustainability of our coastal marine resources. They will use the Howard Lab's facilities and contribute to diversity in marine science while working side-by-side with NOAA Fisheries scientists. The students will learn about careers at NOAA Fisheries and receive mentorship to support their development into early career researchers.

Dr. Peter Rowe, Executive Director of New Jersey Sea Grant Consortium notes, "It is important to the Consortium's core mission to serve New Jersey's coast and coastal communities through science and research, and even more significant to contribute to workforce development and diversity within the field. NJSGC is excited to aid in supporting these projects and furthering the important relationship between students and their mentors to expand students' careers into future STEM professionals."

Dr. Beth Phelan, Chief of the Howard Lab's Fisheries Ecology Branch, explained, "At NOAA Fisheries, our key values are people, science, and service as we carry out our mission to provide the scientific information needed for productive, sustainable, and healthy marine ecosystems and coastal communities. Our lab is unique in the mid-Atlantic. We value inclusive partnerships and aim to serve our diverse population equitably. These grants are hopefully the beginning of a bright future."

Project I: It's not just oysters! The importance of biodiversity in restoration studies.

PI Mentor: Dr. Allison Fitzgerald afitzgerald@njcu.edu Mentees: Isabella Soures-Souzam, Lupita Coate, Sonali Rajukar, David Labagais

Oysters are an important part of shallow estuary ecosystems along the Atlantic coast. However, in Raritan Bay and up through the Hudson Estuary in New Jersey, these oyster reefs were decimated by years of overharvesting and pollution. Climate change has led to stronger storm surges along the NJ coastlines, and successful oyster reefs function as a 'living shoreline', protecting the shoreline from flooding and damage. Artificial oyster reefs, created with cement structures and living oysters, have been used in NJ successfully; however, after 2-3 years the living oysters die off and recruitment of new oysters is very low. One reason for this could be other organisms growing on the artificial shoreline structures preventing the oysters



Oyster castle with oysters and algae growing on it.

from coming back.

In order to investigate, the team from New Jersey City University will do a lab and field experiment this summer at Sandy Hook. Oyster castles®, blocks that are used to build artificial reefs, will be placed underwater at Sandy Hook for 2 weeks - 2 months to accumulate colonizing animals and algae on them. Then, these castles will be brought into the NOAA Howard Lab and baby oysters will be placed in the tank. We will observe the castles for 5 weeks to count how many of the oysters attach to the castles.



Student Isabella identifying organisms.



This project will connect several New Jersey City University undergraduate biology students with the greater marine science community of Raritan Bay and NJ. It will provide an opportunity to work in a government lab using equipment that the students would not have access to at NICU. The students will learn about experimental design, data collection, and analysis techniques. They will also work alongside restoration and aquaculture scientists. This project is also funded by a grant from the NOAA Office of Aquaculture.

The two teams worked together to mark out plots for the oyster castles below the low tide line.

Project 2: How do benthic infaunal communities respond to the insertion of hard substrates?

PI Mentor: Dr. Daphne Munroe dmunroe@hsrl.rutgers.edu Mentee: Sophia Piper

Most of the ocean bottom is composed of soft sediment such as sand or mud. When a hard surface is placed there by humans, animals that prefer to live on hard surfaces like mussels and barnacles are quick to colonize the area, creating an artificial reef. This displaces the animals in the soft sediment. Most research on these interactions focuses on the animals inhabiting the hard structure, but not the soft sediment. Thus, our team from Rutgers University will conduct a field experiment to evaluate the response of the soft sediment community to the insertion of hard surfaces by comparing the community of an existing artificial reef and associated soft sediments with a newly placed hard surface and surrounding soft sediment habitat.



On Jun 1, 2023, Sophia Piper and Megan Natzam (Rutgers) returned to the plots to take "before" oyster castle installation baseline benthic infauna samples. On left: Megan is about to dive for the core, Sophia watches, and in the foreground Jasper, the floating lab assistant, holds bags and samples.



Sophia Piper surfaces with the core to place in a storage bag and place in Jasper. Ann Petersen (FEB/Lynker) assisted Jasper and took photos.

Project 3: Filth fly (Diptera; Muscidae, Calliphoridae) functional biodiversity at wastewater and coastal sites to explore impact on water associated industries

PI Faculty and Mentor Contact Info: Dr. Nicole Fahrenfeld, nfahrenf@rutgers.edu, Michael Monzon mmonzon@njaes.rutgers.edu and Dr. George Hamilton, hamilton@njaes.rutgers.edu Mentees: Jakub Nikscin and Emily Sullivan

A collaborative team from Rutgers University's Departments of Civil and Environmental Engineering, Entomology, and Plant Science will study the potential role of filth-associated flies within the ecology of human and fish diseases. We will sample and test flies from the Sandy Hook Gateway National Recreation Area and a municipal wastewater treatment plant (WWTP) in New Jersey. Our project merges the study of fly biodiversity with studying the microbes like viruses or bacteria in the guts of flies from different locations to learn whether wastewater flies have the same gut microbes as flies from the beach. The main human pathogens of interest are:

- the SARS-CoV-2 virus that causes COVID-19 in humans,
- seafood-borne pathogens like bacteria in the genus Vibrio, and
- the bacterium Aeromonas hydrophila, which are a threat to commercial fish farms.



Filtering water samples with a vacuum pump.



CATHERINE

BARONE from Marlboro, New Jersey is New Jersey Sea Grant Consortium's Communications Intern for the season. A high school graduate of the Marine Academy of Science and Technology, Catherine is no stranger to Sandy Hook. She enjoys exploring and learning about the unique and diverse ecosystems found right in our office's backyard.

Catherine has always been

passionate about preserving New Jersey's precious marine and coastal resources for future generations. She is currently pursuing her Bachelor's in Environmental Science at the University of Pittsburgh and expects to graduate in 2024. In multiple classes Catherine has taken, she has worked on projects relating to sustainable menstrual projects, environmental justice, and anthropogenic influences on ecosystems.

Her passion for the environment does not stop at her degree. She often spends her free time participating in clean ups to remove debris and trash from local New Jersey beaches. During the summer months, Catherine loves traveling to new and exciting state parks around the country to see and photograph wildlife. She finds bird watching relaxing, and loves to spot her favorite birds, the Great Blue Heron and Mourning Doves.

She is excited to learn more about conservation, sustainability, and creating a healthier environment this summer season with NJSGC.

AVA GHANDI from Asbury

Park, New Jersey joins the NJSGC crew for another summer working with Michael Danko, the Assistant Director of Extension and Marine Recreation Agent. As you may recall, Ava spent last summer as a Communications Intern. This season as Extension Intern, Ava will be assisting in conducting the Clean Vessel Act Marina

Survey, which consists of visiting marinas across New Jersey and checking in on their pumpout systems.

Ava is a proud member of the Jersey Shore and has dedicated much of her life and education to learning about marine ecosystems and how to protect marine environments. Ava will be continuing her education in the fall at the University of New Haven pursuing a Master of Arts in Marine Policy and Management.

This project will allow us to draw conclusions about how quickly filth flies become associated with new pathogens found in human waste and provide information about environmental health to people who raise and catch fish in New Jersey.



A fly trap at the beach.

NOAA Administrator Visits the Jersey Shore

Last April, New Jersey Sea Grant Consortium Communications Specialist Samantha Kreisler had the opportunity to accompany National Oceanic and Atmospheric Administration (NOAA) Administrator Dr. Richard "Rick" Spinrad and Office of Naval Research Head of Ocean Battlespace Sensing Department Dr. Tom Drake on their visit to Naval Weapons Station Earle to learn about coastal resilience and restoration projects.

While visiting, the group heard from NJSGC's Coastal Community Resilience Specialist Tom Herrington and



Dr. Tom Herrington and Nick Ginther present to the group.



The group views the location of the oysters at NWSE.

Meredith Comi, Director of NY/NJ Baykeeper's bi-state Coastal Restoration Program.

"It is very exciting to see that New Jersey is being so innovative in using natural infrastructure to stabilize their shoreline and protect communities," said NOAA Administrator Rick Spinrad, Ph.D."NOAA is proud to support investments in a cleaner, healthier, and more resilient future for our coasts and coastal communities."



Ginther Naval, Samantha Kreisler, Emma Kelley, Dr. Richard Spinrad, Meredith Comi, Dr. Tom Herrington and Dr. Tom Drake.



Meredith Comi showing her oyster tanks at NWSE.