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A Newsletter from the New Jersey Sea Grant Consortium

Spring 2024

State of the Shore Event Provides Updates on Shore Summer Conditions and Outlook for the Season

This year's State of the Shore media event was an important opportunity for members of the community and members of the press to meet with coastal expert NJSGC Coastal Processes Specialist Dr. Jon Miller, NJSGC Coastal Resilience Specialist, Laura Kerr, and NJDEP Commissioner Shawn LaTourette to learn how New Jersey's shorelines fared over the winter and what to expect on conditions and storms for our state's beaches during the 2024 summer season.

Coastal flooding, erosion, and wave activity varied from location to location. The northern part of the state experienced higher peak water levels, while the southern part of the state experienced more flooding events. During a January storm, water levels at Sandy Hook measured some of the highest since Superstorm Sandy. However, the storm this past April that dumped several inches of rain and downed trees throughout the state was the most intense storm that impacted Sandy Hook. While some beaches remained relatively intact during this winter, others had erosion that may require some remediation. These small or moderate storms that cause this are expected to become more and more common.

While many beaches suffered little to no erosion,

Watch the recording here

Speakers included Laura Kerr, Dr. Jon Miller and Shawn LaTourette. Greeting the Press was Dr. Peter Rowe Executive Director of NJSGC.

some beaches in the south need replenishment to repair some of the berm erosion suffered by the mild-moderate storms this winter. Beachgoers should be aware of large sand bars produced this winter that can lead to dangerous rip currents. As the memories of Sandy begin to fade, this winter should serve as a reminder of the damage that can be caused by more common storms and the need to continue to maintain our beaches through programs such as the Shore Protection Fund.

The forecast for this summer is predicted to be very eventful. This summer's La Niña conditions are expected to result in more extreme weather. The four independent institutions have reached very similar models of above average number of storms. Despite relatively low probabilities of hurricanes making landfall in general, it's important to remember that it only takes a single storm to create catastrophic impacts.

As always, New Jersey Sea Grant Consortium is excited to provide this year's State of the Shore Report to give the public insight of the condition of New Jersey's beaches. Just remember to be safe: wear your sunscreen, remain cognizant of your surroundings, check conditions, be aware of rip currents, and guard your fries from hungry seagulls. Have a great summer!

22nd Annual

State of the Shore

Media Event

May 23, 2024 Asbury Park, NJ

EDUCATION

Apprenticeship in Shellfish Aquaculture Program (ASAP) Kicks Off Boot Camp Training

Apprenticeship in Shellfish Aquaculture Program (ASAP) is a unique new training concept for New Jersey high school students ages 16 and older to gain understanding about the aquaculture industry through education and practice.

Scenes from the busy days at the Apprenticeship in Shellfish Aquaculture Program Boot Camp

ASAP Boot Camp took place June 24-28th at the Rutgers Cape Shore Lab and the New Jersey Aquaculture Innovation Center in Cape May County. The whole ASAP program runs over several weeks with the mentors. It featured mentorship from Diana Burich, Director of Education at New Jersey Sea Grant Consortium, Dr. Michael Acquafredda, Aquaculture Program Coordinator at New Jersey Sea Grant Consortium, Jenny Shinn, Aquaculture Program Coordinator, and Program Coordinator III at the Haskin Shellfish Research Lab and Lisa Calvo, Owner/Founder of Sweet Amalia Farm/Sweet Amalia Market & Kitchen.

Through a blend of in-person instruction and hands-on farm work experience, 13 high school participants delved into the intricacies of shellfish aquaculture. They acquired entry-level work skills and learned the important processes behind bringing food from the farm to the table. Students' activities varied from oyster and clam dissections and biology, policy and regulation lectures, learning and practicing nursery and husbandry techniques, and hands-on farm training.

The second major component of ASAP is the 8-week long "apprenticeship" beginning in July. Participants are paired with partner shellfish growers throughout the state to learn the daily workings of oyster and/or clam farming. Industry partners range from sole proprietorships to larger grow-out and processing facilities, and provide students with a range of experiences to

prepare them for entry-level positions in the aquaculture industry. In addition, partner farmers serve as mentors throughout the summer as they provide guidance and on-the-job training. Bi-monthly virtual cohort meetings will also be held to give students support and a venue to discuss challenges and accomplishments. Once expectations have been fulfilled, apprentices will receive a Shellfish Farming Practice Certificate that can be used to show potential employers that they have completed this unique training program.

According to Burich, there is no other similar program in New Jersey which led to plenty of encouragement from the aquaculture industry, economic development councils and even the state department of agriculture. As part of the pilot in 2021-2022, project partners worked with educators and industry professionals to identify skills and curricular methods that would best engage students, and active hands-on learning and outdoor experiences were shown to be beneficial. This year's bootcamp relied heavily on these methods, and after the completion of boot camp, participants were given a program evaluation. "100% of the participants strongly agreed that participation in boot camp increased their knowledge of aquaculture, 54% are interested in pursuing a career in aquaculture, and at least one of the participants plans to study aquaculture in college. It looks like we are on the right track to help develop the next generation of shellfish farmers in the state," said Burich.

This project is a collaboration of New Jersey Sea Grant Consortium, Rutgers University's Haskin Shellfish Research Laboratory and industry partners, and brings participants closer to the knowledge and understanding of shellfish aquaculture as one of New Jersey's emerging industries that produces an important food source and contributes to coastal economies. The foundations of aquaculture science and technology are the heart of the program that incorporates industry practices and basic skills training with real-world experiences.

Growing Green Infrastructure Knowledge One Green Infrastructure Champion at a Time

The Green Infrastructure Champions Training Program was offered for a sixth year in a row by Rutgers Water Resources Program Director Dr. Chris Obropta and senior research program manager Dr. Roy Messaros (NJSGC Water Resources Specialist) with ten unique and completely virtual educational sessions offered from January through May 2024. It was a huge success with a total of 197 participants completing five or more sessions to become certified Green Infrastructure Champions and leaders who can advocate for green infrastructure in their communities. Participants represented 20 different counties in New Jersey, and 77 participants were from outside of New Jersey.

Here are the 2024 numbers:
10 training sessions (via Zoom) with an average
    attendance = 181
People who attended at least one session = 350
People who attended at least five sessions a.k.a.
    Green Infrastructure Champions = 197
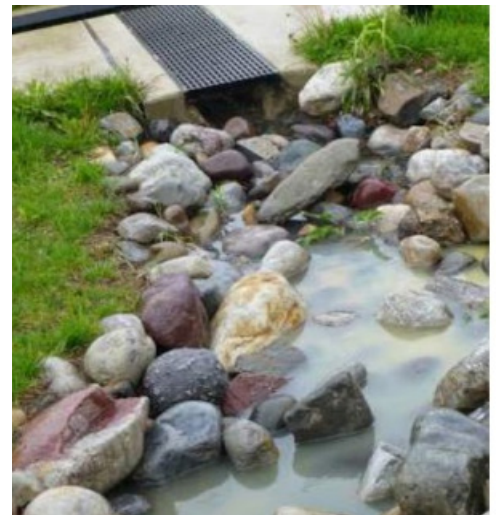Government/municipal organizations = 130
NGOs/Partnerships/Nonprofit Organizations/
    Academic = 164
Private organizations = 39

The Green Infrastructure Champions Training Program is an Extension program that was created to empower local stakeholders to play a dominant role in encouraging municipalities and other property owners to implement green stormwater infrastructure practices. This educational program continues to train and certify Green Infrastructure Champions to be able to: 1) enhance their knowledge through green infrastructure seminars and research, 2) engage community leaders to adopt green infrastructure as a stormwater management solution by updating ordinances and municipal master plans,
3) encourage local non-governmental organizations (NGOs) and schools to incorporate green infrastructure in their existing landscaping, and
4) secure funding for green infrastructure, and 5) publicize implementation of green infrastructure.

RESEARCH SPOTLIGHT

Quantifying the effect of vegetation on a natural dune system using a coupled machine learning and remote sensing approach
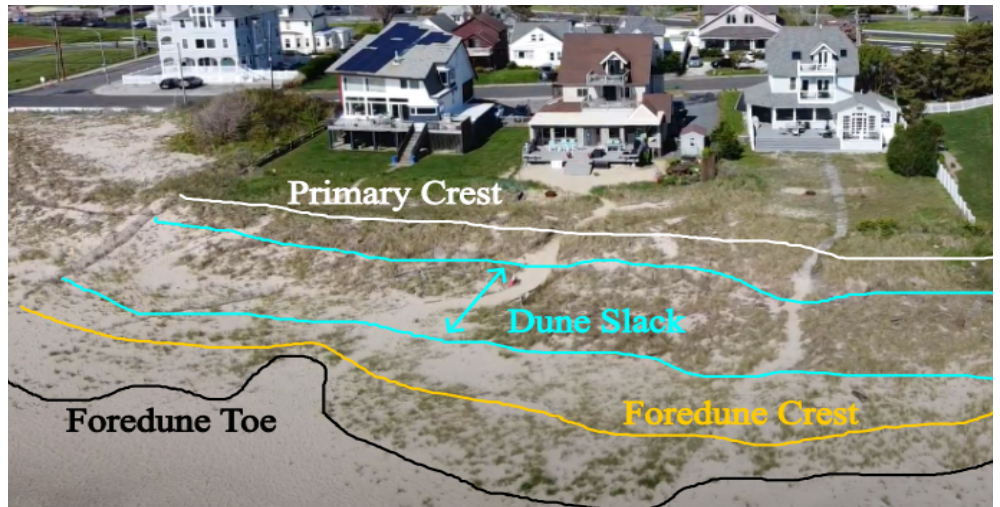
Principal Investigator:
Dr. Jorge Lorenzo-Trueba
Montclair State University

Co-Investigator: Shane Daiek
Ph.D Candidate - Environmental
Science and Management
Montclair State University

Aerial image of the dune complex with major geomorphis boundaries and regions.

Introduction: Coastal dunes are dynamic landforms shaped by the constant interplay of wind, waves, and sediment. These dunes serve as vital barriers, protecting backshore infrastructure from storm surges and providing habitats for various plant and animal species. Despite their ecological significance, there is a lack of quantitative understanding of how vegetation distribution affects dune morphology and volumetric changes. A significant challenge in this field is the absence of effective methodologies to quantify vegetation distribution over extensive coastal areas.

Advancements in Technology: Recent advancements in technology, such as Unmanned Aerial Systems (UAS) and spectral imaging, offer new opportunities to accurately measure the spatial distribution of dune vegetation and its impact on sedimentation rates. These technologies enable the detailed study of vegetation patterns and their effects on dune dynamics.

Project Aim: This project aims to enhance our understanding of the relative effect and spatial distribution of vegetation on coastal dune systems. We employ a coupled approach that integrates machine learning techniques with remote sensing using high-resolution UAV imagery. This methodology allows us to identify spatial patterns of vegetation coverage on the dune complex at our study site in Long Branch, New Jersey.

Methodology: Our objective is to assess how vegetation influences sediment partitioning on the dune complex during intra-storm periods when aeolian transport and wave run-up are the primary drivers of sediment movement. By utilizing Light Detection and Ranging (LiDAR) data, we can incorporate the elevation of plant clusters to improve classification accuracy. The combination of plant height data with waveband data provides additional inputs for our machine learning model, enhancing prediction accuracy. In addition to vegetation analysis, we will examine sediment exchange from the offshore subaqueous environment to the dune complex using bathymetric survey data and in-situ sedimentation rate measurements.

Implications for Coastal Management: The findings from this project will offer valuable insights for coastal planners regarding vegetation dynamics and sedimentation patterns in coastal areas of New Jersey. Coastal dunes in New Jersey frequently require renourishment and engineering to mitigate erosion and protect infrastructure from future storm impacts. Understanding the natural evolution of these systems will help coastal managers develop more effective mitigation strategies.

Conclusion: This project leverages cutting-edge technology to quantify the impact of vegetation on coastal dune systems. By integrating machine learning and remote sensing, we aim to provide a comprehensive understanding of how vegetation influences dune morphology, aiding in the development of informed coastal management practices

American dune grass commonly found along New Jersey coastlines.
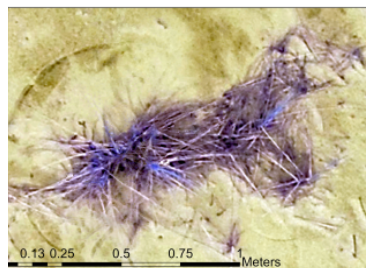
Planview image of *ammophilia brevigulata,* American beach grass, from multispectral sensors.

NJSGC IN YOUR COMMUNITY

NJSGC Staffers attended the 2024 Mid-Atlantic Meeting in Virginia Beach

Mike Danko, Assistant Director of Extension, Samantha Kreisler Communications Specialist, Diana Burich, Director of Education, and Laura Kerr, Coastal Resilience Specialist, attended the 2024 Mid-Atlantic Meeting in Virginia Beach. They enjoyed networking with colleagues from regional Sea Grant programs and the National Sea Grant Office.

Laura Kerr, NJSGC Coastal Resilience Specialist, presented her work with the New Jersey Coastal Resilience Collaborative.

Diana Burich, NJSGC Director of Education, gave a presentation on her Eco-Ambassador project.

Knauss Fellow Oluwafemi Soetan visited Juneau, Alaska April 1-3 for the Alaska Seaweed Genetics Workshop.

Samantha Kreisler, NJSGC Communications Specialist, and Laura Kerr, NJSGC Coastal Resilience Specialist, attended the Jersey Shore Partnership Annual Summer Celebration.

21st Ocean Fun Days continued to thrill visitors

On May 18th, Ocean Fun Days made a splash at Island Beach State Park, followed by an exhilarating day at Sandy Hook Gateway National Recreation Area on May 19th. This year was the celebration of 21 years of Ocean Fun Days, filled with thrilling crab races, colorful arts and crafts, touch tanks, and a chance to engage with marine scientists at the National Oceanic and Atmospheric Administration Northeast Fisheries Science Center.

WELCOME NEW NJSGC STAFF

Samantha Maxwell - Education K-12 Program Coordinator

Samantha Maxwell, who goes by Sam, has always had a passion for marine science. Growing up, she spent lots time on the beach and at the aquarium in her parents' hometown of Point Pleasant Beach, and traveling to other beaches along the east and west coasts of the United States and the Caribbean. Torn between wanting to pursue a career of veterinary medicine and marine science, she originally became a veterinary technician. With the dream of working in marine science ever present, she decided to go back to college and set a goal to earn her BS Degree in Marine Science with a concentration in marine biology before she turned 30. Sam graduated summa cum laude from Stockton University in 2022 with a few months to spare, achieving her goal. During her time at Stockton, she was afforded many opportunities for field work and to volunteer by the faculty in the marine science program and at the marine field station.

During a job search, one such faculty member pointed Sam in the direction of the New Jersey Sea Grant Consortium. In the spring of 2023 she became a field instructor for the K-12 field trip program and returned for the 2024 field trip season, loving that she could educate and foster the same love for marine science that other environmental educators fostered in her when she was younger. Half way through this spring, Sam accepted the offer to become the K-12 Program Coordinator and assumed the role on June 1, a week after she got married.

In her spare time, Sam either spends her time with her husband, their two cats, and two newly adopted kittens, reading, crocheting or knitting, watercolor painting, or at the beach. She also has a lifetime goal to visit as many of the Association of Zoos and Aquariums accredited aquariums in the United States as she can.

Yazemin Yilmas - Communications Summer Intern

Yazemin Yilmaz is joining New Jersey Sea Grant Consortium as a Digital Communications Intern. She has had a lifelong love for the sea ever since she moved to Port Monmouth. It all started in her first summer living by the shore. When she learned about New Jersey Sea Grant's summer camp, Yazemin was determined to be a part of it. Every year up until she aged out, she began a tradition of selling iced tea and lemonade in her front yard to fund her camp fees.

Though Yazemin has a deep love for marine science, she pursued Film & TV at Montclair State University, hoping to become a marine documentarist. She recently graduated, becoming the first in her family to earn a degree. Her family is happy to see Yazemin come full circle; once a Sea Grant camper and now an intern. When she's not working behind a camera, you can find Yazemin biking along the Jersey coast.

Yazemin is excited to help the team grow by creating fun and educational marine science content. She looks forward to sharing her love for the ocean with others and inspiring them through New Jersey Sea Grant Consortium's work.

John Moran - Communications Summer Intern

John Moran is an undergraduate currently studying at the University of Rhode Island majoring in marine biology with minors in chemistry and oceanography. This summer he is working with Communications Specialist Samantha Kreisler as a Communication Intern.

John has always had a passion for science communication; in high school he wrote for his school newspaper and currently writes for The Good Five Cent Cigar, URI's student newspaper, focusing on science news and stories. John knew from an early age that he wanted to pursue an education and career in the marine sciences field. He is no stranger to the Jersey Shore, growing up in Matawan, he attended Sea Grant's Marine Science Summer Camp and several Ocean Fun Days. He hopes that the biological factors of the Blue Economy are studied and accounted for the betterment of the global marine environment and human condition.

In his limited free time, John enjoys hiking, cooking and swimming. He hopes to expand his underwater capabilities by getting a SCUBA certification this upcoming semester.

In the future, John hopes to pursue a PhD in a marine science related field and wants to conduct research while educating the next generation of scientists on the vast extent and importance of marine systems.

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