

LIFE ON THE EDGE

A quarterly report of the Jacques Cousteau National Estuarine Research Reserve

FOURTH QUARTER 2021

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2021 NERRS ANNUAL MEETING

CONNECTING THE 29 RESERVES THROUGH THE VIRTUAL WORLD

Every year, the 29 reserves around the country gather together for a week of collaboration to develop both long and short-term program strategies for the National Estuarine Research Reserve System. The meeting brings together all program sectors - management, research, education, training, stewardship, and representatives from the reserve system's Friends and Foundation Networks - to provide and share relevant information to forward the growth and evolution of the system.

Each year, the theme of the meeting is driven by the priorities of the coastal management community and system. During the first year of the new Biden-Harris Administration, several priorities were identified that align with the Reserve System's goals: the climate crisis, protection and preservation of America's lands and waters, and diversity, equity, inclusion, justice, and accessibility for all.

The reserve system has been working on these priorities, particularly how we can understand the impacts of climate change and help communities mitigate and prepare for those impacts, how we can best preserve and protect important coastal habitats and maintain the estuarine ecological units that represent each biogeography in the system, and how we can best serve, engage, and honor the diverse audiences within our coastal communities.



PC: LIFE ON THE EDGE DRONES

This November marked the second virtual meeting for the Reserve System. This past year we truly embraced our 'of, for, and by the people' approach and came together to pull off the week-long conference without the assistance of a production company. This also allowed the system to waive the registration fee, giving all members of the reserve system the ability to participate. While the virtual format presented its challenges, the entire system stepped up to the plate to put together interactive sessions that foster collaboration, creativity, and the truly embrace that interdisciplinary nature of our work.

The challenges posed by the pandemic have made us stronger, smarter and more nimble. We are ably prepared for the future because of the challenges we have faced. With that said, we look forward to providing you with an insider look through the lens of the Reserve System that only scratches the surface of the exciting work that was done during the 2021 NERRS Annual Meeting.

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MANAGER'S REFLECTIONS

The NERRS/NERRA 2021 annual meeting represented the second year in a row that the event was held virtually. A few items were rather noticeable to me. First, the Reserve Community has adapted so well to meeting in a virtual manner. The preparation, technical support, and structure led to a very successful, interactive exchange of ideas and discussion of priorities. I believe that when we do return to in-person meetings, some elements of the meeting could also be delivered virtually to enable more members of our community to participate. Certainly the plenary sessions are candidates for this approach. With respect to the 2021 plenary, I had the privilege of facilitating the session which featured a stellar panel of coastal experts including Brenda Mallory (Chair, CEQ), Rick Spinrad (NOAA Administrator), Rick Bennett (USFWS) and Eva DiDonato (NPS). The panelists addressed several key issues ranging from conservation to climate resilience and equity. Remarks provided some good opportunities for collaboration, sharing of information and lessons learned, and broader awareness of the NERRS among our CEQ, USFWS and NPS colleagues.



MICHAEL DE LUCA

Finally, I'd like to commend the JC NERR staff for their exceptional contributions to the annual meeting which featured staff leading a cross-sector session, leadership and workgroup meetings, a bevy of poster contributions and, of course, our own Lisa Auermuller receiving the NERRS/NERRA outstanding award for contributions to the System and Association. I look forward to attending the 2022 meeting in person in Seattle, and to hosting the annual meeting in New Jersey in 2023.

-Michael De Luca, JC NERR Manager



BOARDWALK OF GRASSLE MARSH TRAIL

JC NERR-LED SESSIONS

While the leads of our core sectors all held prominent positions in the development and implementation of multiple presentations and sharing sessions, the JC NERR were the main leaders of two sessions during the annual meeting.

OPENING PLENARY - "TACKLING CLIMATE AND CONSERVATION IN DIVERSE COASTAL COMMUNITIES"

The first was the opening plenary session that kicked off the annual meeting. JC NERR Manager Michael De Luca led the session, the objective of which was to discuss the Biden Administration initiatives as they relate to opportunities for the NERRS. JC NERR Communications and Outreach Coordinator Amy Plantarich provided assistance in planning and technical facilitation of the plenary session.

The plenary featured 4 panelists to discuss and explore how the NERRS may play a role in climate science, mitigation, and resilience; conservation of 30% of our lands and waters by 2030; and racial equity and support for underserved communities. Featured panelists included: Dr. Rick Spinrad - Secretary of Commerce for Oceans and Atmosphere NOAA, Brenda Mallory - Chair of the White House Council for Environmental Quality, Dr. Rick Bennett - US Fish and Wildlife Service Regional Scientist, and Eva DiDonato - Ocean and Coastal Resources Program Lead for NPS.

The panelists provided short remarks to introduce their role and goals as they related to Administration priorities of conservation, climate resilience, and equity. Mike then led a facilitated dialogue with the panelists. Key takeaways included opportunities for the NERRS to help develop a predictive capability to inform coastal resource management in response to range shifts due to climate change, establishment of a Climate Conservation Corps, expansion of the NERRS, new partnerships with organizations to address impacts of climate change, and dissemination of emerging best practices to support a diverse workforce.

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CROSS-SECTOR PROFESSIONAL SHARING SESSION - “AN INTERACTIVE RESILIENCE SELF-ASSESSMENT TOOL (R-SAT) FOR MPA (MARINE PROTECTED AREAS) MANAGERS”

Beginning in 2017, Mike De Luca and Lisa Auermuller (JC NERR Assistant Manager) have worked with a team of international investigators to develop a web-based tool to conduct self-assessments of resilience for marine and coastal protected areas. Partners include MPA managers from Europe, Africa, Central and South America, and the U.S. Analysis of best practices employed by project partners guided development of the tool which is designed to help MPA managers prioritize strategies to enhance resilience of MPAs to climate change and, in some cases, impacts of increasing urban development and the loss of biodiversity.

Use of the tool also presents opportunities for MPA managers to conduct peer-to-peer exchanges of management strategies and case studies. Jean-Jacques Goussard, principal investigator for the project, provided a presentation and demonstration of the tool. Mathieu Ducrocq, one of the project investigators, demonstrated how the tool has been used by and tailored to MPA managers in Senegal. Mike De Luca discussed his thoughts on use of the tool for other US MPAs and with land management partners of the JC NERR. Participants had the opportunity to test drive the tool in breakout groups.

The initiative is funded by the European Commission and is being expanded to regional networks throughout the Atlantic Ocean Basin, Mediterranean Sea and to countries in southeast Asia.

STAFF-LED POSTER SESSIONS

Andrea Habeck (JC NERR Stewardship Coordinator), Thomas Grothues (JC NERR Research Coordinator), and Taylor Armstrong (NOAA Margaret A. Davidson Graduate Fellow) all presented posters during the open poster-sharing session at the annual meeting. Dr. Grothues presented 3 posters on research activity related to NERR goals, including a pilot project on ray predation of farmed clams, an acoustic observatory, and an effort to redesign urban seawalls (Find out more about these projects in the Research Sector Highlights section below!). Andrea presented a poster covering the Summer 2021 LSAMP, JC NERR, & NJAIC Undergraduate Internship program. Taylor presented a poster based upon her fellowship research titled “Do Pinelands Protect an Estuary from Harmful Algal Blooms?”.

JC NERR STAFF - REFLECTIONS & FAVORITE SESSIONS HIGHLIGHTS

While there were many informative, engaging, and collaborative sessions, both within the sectors and well as across sectors, we asked our staff to identify their favorite session from the 2021 NERRS Annual Meeting.

Lisa Auermuller - Assistant Manager

“The NERRS Annual meeting was bittersweet for me. The JC NERR should have been hosting the 2021 meeting here in NJ, and despite knowing the best choice was made to keep it virtual, it was still challenging not to be together again. It will make 2022 in Seattle, WA all the more special. What has not changed is the spirit of the NERRS. Passion and dedication comes through, even virtually, as our colleagues share lessons learned about past work and think big about future opportunities. I was super surprised this year with the NERRS/NERRA award for Outstanding Contributions. I am now in a club with very amazing folks who have been honored this way before me. My twenty years with the NERRS family has been a learning and growing experience. I hope for many more opportunities to be able to contribute and show the world what being a #NERRd is all about!”



LISA AUERMULLER

Lisa’s favorite session from the annual meeting was the Mid-Atlantic Regional Session. The goal of this session was to strengthen regional connections among research reserve staff and programs in the Mid-Atlantic. Regional sectors broke out into discussion groups to identify existing regional projects that reserve staff will continue to invest in (and new ideas to explore), and build momentum for further collaboration. Following the sector discussions, all participants came together as a whole to share key takeaways and identify next steps.

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JC NERR STAFF - REFLECTIONS & FAVORITE SESSIONS HIGHLIGHTS (CONT.)



KAITLIN GANNON

Kaitlin Gannon - Education Coordinator

Kaitlin remained on the Annual Meeting Education Sector planning team this year, assisting with day-to-day agendas, session planning and facilitation. Session topics for the education coordinators this year included thinking broadly about future education programming, what new COVID adaptations do we see being incorporated permanently into reserve programs, information about NERRS Science Collaborative grant funding opportunities, guidance on market analysis and needs assessments, and sharing resources. Education coordinators also had the opportunity to meet and share with the new NERRS Education Coordinator, Stacy Cummings.

Kaitlin's favorite session was titled "Time Travel to the 2071 EC Sector Meeting". During this session, participants had the opportunity to time travel across the Education Sector history to explore change: from the wonder of 50 years ago with no content standards or metrics for impact, to the 2071 Annual Meeting where the sector is a 21st Century modern marvel that we can only begin to imagine and create.

"I also enjoyed other cross-sector sessions such as discussing human dimensions with NERRS programs and cultural ecosystem services. During our Mid-Atlantic regional meeting, we talked about regional climate change conferences, internships, and science communication through art. I felt there were some really rich conversations during the annual meeting this year. Whether in person or remote, I always leave the NERRS Annual Meeting feeling invigorated and inspired by all the great work going on!"

Gregg Sakowicz - SWMP (System Wide Monitoring Program) Technician and Field Researcher

"One particular benefit of the virtual platform is the ability to distribute information and conduct trainings of virtual tools. I was particularly impressed and excited by the SWMP CLUE system introduction and training; it felt like I was watching the next step in SWMP data usage and visualization materializing before my eyes as we were provided step-by-step training. I can foresee great potential in education and messaging once we become more acquainted and comfortable with it."

During the SWMP CLUE system session ("Get a CLUE about SWMP! Classifying Land Use and Ecosystems (CLUE) as a tool for expanding the use of SWMP in research, education, and coastal management across the NERRS"), Dr. Jude Apple, the Director of the Padilla Bay NERR led participants through an introduction and training of this new system, that integrated the Coastal and Marine Ecological Classification Standard (CMECS) and Coastal Change Analysis Program (C-CAP) to provide detailed characteristics of each SWMP station across the Reserve system. This novel and valuable tool will help advance research and data analyses, enrich educational programs, promote engagement with SWMP data, and address coastal resource management priorities.



GREGG SAKOWICZ

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JC NERR STAFF - REFLECTIONS & FAVORITE SESSIONS HIGHLIGHTS (CONT.)

Patricia McHugh - SWMP Assistant Technician

“This was the first NERRs/NERRA Annual meeting that I attended and everything was held virtually. I think the format of the meeting was excellent and everything ran very smoothly for having to be entirely virtual. I also enjoyed the fact that they had different presentations based on the different sectors. I joined the Research sector meetings that had a wide variety of NERRS projects being discussed as well as collaborations with outside organizations. My favorite session description can be found below. It included a new GIS tool to monitor SWMP sites, and we broke out into groups to test out the program. It was a very visually appealing way to look at water quality data at all of the reserves. The only challenge I would say is, as a newcomer it’s a bit more difficult to get to know someone in a virtual environment. Especially with the large sector sessions—it’s a great introduction and a great way to get information out to a large group of people, just a little harder to network! Overall I think it was a great opportunity, and I look forward to the Technician Training Workshop in February 2022!”



PATY MCHUGH

Patty’s favorite session from the annual meeting was the joint-sector sharing session between the Research and Stewardship sectors. Participants met together to cover joint sector updates including Sentinel Sites as core SWMP Habitat Mapping and Change Strategic concepts; the submerged aquatic vegetation (SAV) national product, HITIDER and marsh migration work.

ASSISTANT MANAGER LISA AUERMULLER - WINNER OF THE NERRA/NERRS AWARD FOR OUTSTANDING CONTRIBUTION!

The NERRA/NERRS Award for Outstanding Contribution honors leaders that demonstrate exemplary leadership and sustained commitment to the mission of the National Estuarine Research Reserve System. The award is given to those whose enduring dedication to achieving the goals of NERRS has significantly advanced understanding, care and protection for estuarine ecosystems. The announcement of this award is always an exciting part of the NERRS Annual Meeting each year. The inaugural winner of the award, back in 2006, was Manager Michael De Luca. This year, Mike submitted the nomination letter for JC NERR Assistant Manager Lisa Auermuller.

“I have known Lisa for more than 20 years, from when I hired her as a Watershed Coordinator for the Cousteau Reserve, her subsequent tenure as the Coastal Training Coordinator, and most recently as the Assistant Manager for the Cousteau Reserve...I recognized that her skillset and personality was a great fit for leadership nationally in the NERRS and for NERRA. [Because of this] I advocated for her to take on a leadership role at NERRA, and she served as Vice President for two years and is the Immediate Past President having served from 2017-2020....As President of NERRA, Lisa served as an outstanding ambassador for the reserve system....Most recently, Lisa’s value as a national force in the coastal resilience field was recognized by NOAA which engaged her as an expert to develop use cases for the newly established Water Resources Center.

Lisa has served NERRA and the national system extremely well for the past 20 years. Her dedication to NERRA is evident in her leadership during challenging times when the program was proposed for elimination by the administration, and her resolve to restructure NERRA for continued and sustainable success. Her creative approaches to coastal resilience has significantly advanced understanding, care and protection for estuarine ecosystems and coastal communities. I am very pleased to provide my strongest recommendation for Lisa as the 2021 recipient of the NERRS-NERRA Annual Award.”

-Michael De Luca

Lisa Auermuller was announced as an award recipient during the Annual Meeting Award Ceremony on Nov. 16th. We extend our warmest congratulations to Lisa! We look forward to seeing how she continues to lead & inspire for many more years to come!

2021 IN REVIEW

While the COVID-19 pandemic showed its challenges throughout the year, it was no match for our staff! Those challenges made us stronger as we continued to work hard each day to fulfill our mission to improve management of New Jersey coastal environments through science, education, and stewardship.

Let's take a look at how we impacted the education and research communities in 2021!

EDUCATION & PUBLIC PROGRAMS

1,168

COMMUNITY MEMBERS ATTENDED
OUR PUBLIC PROGRAMS (INCLUDES
VIRTUAL & OUTDOOR)

134

STUDENTS PARTICIPATED IN
EDUCATION PROGRAMS

115

OF TEACHERS WE WORKED WITH
THROUGH PD, WORKSHOPS, ETC.

SWMP PROGRAM

WATER QUALITY

TEMPERATURE, SPECIFIC CONDUCTIVITY, SALINITY,
DISSOLVED OXYGEN, DEPTH, PH, & TURBIDITY

4 STATIONS X 7 PARAMETERS X 4 SAMPLING EVENTS PER HOUR X 24 HOURS X 365.25 DAYS

981,792 DATA POINTS

NUTRIENTS

ORTHOPHOSPHATE, NITRATE, NITRITE, AMMONIUM,
DISSOLVED INORGANIC NITROGEN, CHLOROPHYLL

6 PARAMETERS X 22 SAMPLES PER MONTH* X 12 MONTHS

1,584 DATA POINTS

METEOROLOGICAL

TEMPERATURE, HUMIDITY, ATMOSPHERIC PRESSURE, WIND SPEED,
WIND DIRECTION, PRECIPITATION, SUNLIGHT INTENSITY (PAR)

1 STATION X 7 PARAMETERS X 4 SAMPLING EVENTS PER HOUR X 24 HOURS X 365.25 DAYS

245,448 DATA POINTS

BREAKING GROUND ON THE JC NERR'S NEW EEL MONITORING PROJECT!

Since 2008, our neighbors to the north at the [Hudson River NERR](#) have been successfully monitoring glass, or juvenile, eels in various sites along the Hudson River with help from local citizens. Now, through a 2020 transfer grant, this fun and slimy citizen science opportunity will be offered at the JC NERR within the next couple of years. The two-year grant project, titled “Adopting program coordination methods and best practices to launch community-driven research efforts on the American eel (*Anguilla rostrata*)” and funded by the NERRS Science Collaborative, includes team members from the JC NERR, HR NERR, and Stockton University. During the project period, the team will work together in testing potential monitoring/field work sites, pilot trainings with volunteers and teachers, and transfer the HR NERR’s best practices for program implementation. In addition, outreach materials and tools will also be developed.



PC: TOM MCDOWELL AND THE HR NERR

The JC NERR hopes this eel monitoring program will strengthen relationships between the Reserve and surrounding communities, as well as provide useful information about the American eel (*Anguilla rostrata*) to fisheries managers. Unfortunately, this project was initially delayed due to the COVID-19 pandemic, but has since marked its initial start as of October 1st, 2021.

After the conclusion of the grant period, this citizen science opportunity will be open and ready for community members to participate by fall 2023. To learn more about this project, check out the project website here – [Launching a Community Science Eel Monitoring Project](#). In addition, if you’d like to learn more about the HR NERR’s eel monitoring efforts, check out the [amazing work they’ve been doing over the years!](#)

“I’m so excited to work with the folks at the Hudson River NERR & to begin eel monitoring efforts at our Reserve. This will provide residents, students, teachers & other community members a unique opportunity to get muddy & contribute to science!”

-Kaitlin Gannon, JC NERR Education Coordinator and Project Lead

WECRABNJ - FURTHERING EDUCATION AND OUTREACH EFFORTS



Education and outreach efforts for the “Next Generation Marine Debris Removal 2018” grant were well underway this summer and concluded this fall. [Stockton University](#) partnered with the JC NERR for this grant, and the [NOAA Marine Debris Program](#) provided a portion of the funding. JC NERR staff crafted new digital products and reorganized the [WeCrabNJ.org](#) website- a resource for commercial crabbers, recreational crabbers and educators on the impacts, prevention, and removal efforts of derelict crab pots.

Efforts included filming content for videos including: drone images taken by JC NERR Volunteer Rob Auermuller, and stills, B-roll footage of the salt marsh, action shots of crabbing gear in-use, and an explanation of proper crabbing gear for commercial-style pots captured by JC NERR Communications and Outreach Coordinator Amy Plantarich. This content was not only used for the website itself, but in a new video resource on how to “Rig-It-Right”. An ArcGIS StoryMap was also generated, which has been added to the website to show the timeline of all of the derelict crabbing removal and prevention projects over the years. The StoryMap explains how the projects started with grant funds from NOAA and the impact it has had on the bay, local communities, and various stakeholders. Be sure to check out the [newly revamped website](#), [StoryMap](#), and ["Rig-It-Right" video!](#)



RECOVERED GHOST POTS

NEW RESEARCH CONSORTIUM PROJECT AIMS TO TRACK CHANGES & INFORM MANAGEMENT OF THE BARNEGAT AND GREAT BAYS

In December 2021, the JC NERR, along with multiple other NJ partners and institutions, were awarded a grant to fund the implementation of the newly-established New Jersey Consortium for Resilient Communities. In addition to the JC NERR, partners include Monmouth University, Stevens Institute of Technology, Stockton University, NJ Sea Grant Program, Montclair University, NJ Institute of Technology, and Rutgers University. The goal of this project, titled “Barnegat Bay and Great Bays Resilience Observing Network: Tracking the Changing Environment to Inform the Management of Estuarine Resources” is the integration of climate change research, resiliency planning, and monitoring data to inform the proactive adaptation and management of estuarine resources.

The outcome of the JC NERR and Rutgers University portion of the project is to provide an improved understanding of the information needs of estuarine resource managers to support proactive resilience strategies. This will include design characteristics of a representative coastal bay observing network, the Barnegat and Great Bays Resilience Observing Network, gaps in existing monitoring data and the development of site specific research models.

This will be accomplished via three tasks. The first will be the implementation of a focus group of estuarine resource managers, individuals that are responsible for management of fisheries, aquaculture and restoration programs in Barnegat and Great Bays to assess the information needs of resource managers to support sustainable management of estuarine resources. Following the focus group gatherings, a survey will be implemented to: identify existing long-term monitoring and observing infrastructure that can support predictive models to inform the management of estuarine resources due to climate change impacts in Barnegat Bay and the Great/Bay Mullica River; and develop a research and observing blueprint to guide future modeling of changing ecosystem dynamics and range shifts in habitats and living resources. This survey will seek the input of those in the regional research and observing system community. Finally, information gathered from tasks one and two will be analyzed and compiled into a white paper and serve as the basis for a research plan for developing a predictive capability for managing estuarine resources in the Barnegat Bay and Great Bay/Mullica River region.

All three tasks of this project will be implemented and completed by June 2022.

NEW - WINTER SCAVENGER HUNT FOR GRASSLE MARSH TRAIL

Grassle Marsh Trail Scavenger Hunt
Fun in the Frost

As you travel along the trail, try to find the plants and animals on the lists below. Put a check mark next to the ones you see! Need help? Try out the Naturalist or Seek Free mobile app! (Seek is great for young explorers!)

Birds <input type="checkbox"/> Sandhill Crane <input type="checkbox"/> Trillium <input type="checkbox"/> Mourning dove <input type="checkbox"/> Downy woodpecker <input type="checkbox"/> Blue Jay <input type="checkbox"/> House sparrow	Mammals <input type="checkbox"/> East cottontail <input type="checkbox"/> White-tailed deer <input type="checkbox"/> Eastern chipmunk (house pine) <input type="checkbox"/> Red fox <input type="checkbox"/> Striped skunk (house pine) <input type="checkbox"/> Eastern coyote
Plants and Trees <input type="checkbox"/> American holly <input type="checkbox"/> Red Maple <input type="checkbox"/> Prunella <input type="checkbox"/> Atlantic white cedar <input type="checkbox"/> Mountain laurel <input type="checkbox"/> Pink pine	Other Observations <input type="checkbox"/> What does what you see?

Please do not disturb any critters or plants that you see while participating in the scavenger hunt.
Do not venture off of the designated trail. Thank you!

Grassle Marsh Trail Scavenger Hunt
Fun in the Frost

A piece of litter?	Frozen tree	Foot prints	Something Orange	Bird
Berries	Ice	Something Smooth	Pine Needles	Nest in tree
Pinetone	Animal Tracks	FREE	Tree frog	Animal scat
White-tailed deer	Decomposing leaves	Frozen puddle	Holly leaf	One Cardinal
Snowflake	Fallen Tree	Bird feather	Snowman	Something Blue

*If you do find any litter, please be sure to throw it away

Please do not remove any items from the trail while participating in the scavenger hunt. Be courteous to other trail enthusiasts and wildlife alike. Thank you!

Grassle Marsh Trail Scavenger Hunt
Fun in the Frost

To Listen For

- Bird chirping
- Wind blowing
- Frozen tree
- Melted ice dripping

To Smell

- Decomposing leaves
- Pine tree
- Wet tree bark

To Feel

- Cold breeze
- Ice
- Snowflakes

What else can you see, hear, feel, smell?

Check out our NEW Fun in the Frost Scavenger Hunt, this time with a brand NEW activity level so even the youngest explorers can join in on the fun! Featuring a brand new sensory level, all three levels of our scavenger hunt are perfect for young explorers. While it is modeled for a walk along our Grassle Marsh Trail, this scavenger hunt can be enjoyed anywhere in NJ!

Download PDF and PNG versions of the scavenger hunts [here!](#)

NEW FACES AT THE COUSTEAU CENTER

We've been busy on the staffing front during the final quarter of 2021, welcoming two new members to the JC NERR: Paul Signore and Anabel Rosero. Learn more about them and how they are helping us fulfill our mission each day!

Paul Signore - AmeriCorps Watershed Ambassador

Meet Paul Signore, the JC NERR's AmeriCorps Watershed Ambassador for the 2021-2022 season. The Watershed Ambassador Program works to promote education and stewardship of watersheds through community involvement and performing biological stream assessments. They also offer environmental education programs to schools and community organizations at no cost! Paul is able to perform in-person and virtual classroom sessions on macroinvertebrates, the importance of a healthy watershed, non-point source pollution, and much more! We are very much looking forward to having Paul here, working with us and the local community!



“My name is Paul Signore and I am the ambassador for the Mullica Watershed Management Area (WMA 14). I have been a marine science educator for 6 years teaching youth about the local wildlife and ecosystems. I have lived on Barnegat Bay for 20 years and have spent the majority of my time observing and interacting with its inhabitants firsthand. My purpose in life is to share the water's wonder with others and inspire awe for species of all kinds just as I felt growing up. As the watershed ambassador for WMA 14, I will be able to use my experiences and passion for nature to educate others and help preserve water quality within the Mullica River region.

As the ambassador of the Mullica Watershed Management Area, I have been working on a few projects throughout the region. I have performed stream assessments at sites such as Wading River and Papoose Branch to estimate water quality based on the present aquatic invertebrates. According to my data, all water bodies that I have surveyed have had suboptimal to optimal health ratings, indicating that there is minimal pollution. I have also conducted presentations at schools such as Galloway Middle School and Sooy Elementary to educate students about the Mullica WMA. I have also helped in removing invasive plants such as Autumn olive from Glenn Park in Galloway. Upcoming projects include a marsh monitoring station at Grassle Marsh and native plant gardens at Batsto Village.”

If you have any questions, or are an educator and would like to schedule a classroom visit with Paul, he can be reached at watershed@marine.rutgers.edu.

Anabel Rosero - Laboratory/Assistant Technician

Anabel Rosero is our most recent new addition to the JC NERR team as our new Laboratory/Technical Assistant! Anabel will be working with our team up at the Sandy Hook Research Cooperative Program. Within the first week of coming on board, she had already fully immersed herself, boots in the mud, in our GIS surveys and field work. We are very grateful to have her on our Sandy Hook team!



“Hi! My name is Anabel Rosero. I graduated from Rutgers University in May 2021 with a B.S. in Ecology, Evolution, and Natural Resources and a certificate in GIS. I also received my A.S. in Environmental Science from Raritan Valley Community College in 2019. In the past, I've worked on projects surrounding water quality issues and fish hatchery data management. A fun fact about me is that I love thrifting, and it is my favorite way to be more sustainable!”

JC NERR STAFF EXPANDING THEIR REACH ON LOCAL AND NATIONAL COMMITTEES

Many members of the JC NERR team not only apply their work to internal JC NERR projects and programs, they also lend their skills and knowledge to help serve the broader conservation and management communities and organizations through committees and working groups. Below are just two of the many seats our staff sit in, for the local community, state, and national levels!

MANAGER MICHAEL DE LUCA HAS BEEN INVITED TO SERVE ON A NATIONAL TECHNICAL WORKING GROUP!

On July 1, 2021, the USDA published the new [National Aquaculture Health Plan & Standards 2021-2023](#) (NAHP&S). In this updated plan, the USDA proposed a Technical Working Group charged with providing information and data to support the national plan. Michael De Luca has been invited to serve on the working group and recently participated in the kickoff meeting to guide national aquatic animal health management within the United States. He represents the mollusk hatchery and production community on the work group.



PC: RUTGERS UNIVERSITY HASKIN LAB

The NAHP&S establishes guidance for national disease reporting, laboratory and testing standardization, surveillance, response, biosecurity, data management, and education and training, which will benefit the nation's aquatic animal health. It also outlines health inspection options to provide consistent and verifiable ways to establish, maintain and certify the health and safety of aquatic livestock, and lists the actions USDA will take in each of these areas to implement the plan. These actions will support the overall health of the aquaculture industry, which will provide protection and assurance for producers of farm-raised aquatic animals in the United States.

The USDA is the primary federal entity with oversight over livestock and other agricultural commodities, so it is a natural fit to take the lead in providing oversight for aquatic animal and aquaculture health. The USDA will continue to collaborate with the National Oceanic and Atmospheric Administration (NOAA) and the United States Fish and Wildlife Service (USFWS), as well as other Federal, State, and Tribal entities to ensure the health of all aquatic animals in the United States. The NAHP&S will be updated every 2 years as directed by Executive Order 13921. Plan updates will be driven by information received through meetings with the working group.

EDUCATION COORDINATOR KAITLIN GANNON TOOK THE SEAT AS THE NEW CEC CHAIR!

This past July, The JC NERR's Education Coordinator Kaitlin Gannon, became chair of the [Barnegat Bay Partnership's](#) Communication and Education Committee (CEC). The CEC is made up of members from partner organizations who prioritize outreach, education and communication needs about the Barnegat Bay-Little Egg Harbor Estuary and its surrounding watersheds. Before her role as CEC chair, Kaitlin was co-chair for two years and now will serve as chair for another 2-year term. Kaitlin has enjoyed being a member of the CEC over the years, and looks forward to working with her CEC colleagues in this new role.

"I'd like to acknowledge past CEC chairs Shari Kondrup from the Brick Twp. MUA and Wesley Dalzell from ReClam the Bay. Both have done an amazing job as previous CEC chairs and I know I have some big shoes to fill! I am very grateful for this opportunity and I'm really looking forward to working and collaborating with the CEC partners, as well as other BBP committee members to meet our outreach and communication goals for the Barnegat Bay!"

– Kaitlin Gannon

NERRS 2021 FILMFEST

Each year, the National Estuarine Research Reserve System hosts a FilmFest contest in conjunction with the system-wide annual meeting. The goal of the NERRS FilmFest is to highlight the Reserves, our partners, and the amazing coastal resources we protect. This year, the JC NERR submitted two films: "NERRS News - Sharing stories on the benefits of estuaries on coastal communities, critters, and you!" and "Rig-It-Right with WeCrabNJ!". Both films won awards that were announced during the [FilmFest](#) premiere on October 12th.

NERRS NEWS - WINNER OF MARSH MUD AWARD FOR MOST CAPTIVATING

It's NERRS News! Check out our film that shows the many different benefits of estuaries (also called ecosystem services) on coastal communities, critters, and you. Portrayed through the metaphor of a fictional news channel with breaking news stories, commercials, and witty characters, this short film is fun for the whole family!



SCREENSHOT FROM FILM

RIG-IT-RIGHT WITH WE CRABNJ! - WINNER OF THE TERRAPIN AWARD FOR BEST CONSERVATION EFFORTS



SCREENSHOT FROM FILM

Commercial and recreational crabbers rely heavily on NJ estuaries to either make a living or catch some dinner using “Chesapeake-style” commercial crab traps. Boat traffic, incorrectly set gear, vandalism, shifting tides, and storms can unfortunately result in lost or damaged gear. These lost pots are called “Ghost Pots” and they continue to fish, accumulating blue crabs and other species that become trapped in the ghost pots. This has an impact on our estuaries and the enjoyment of the estuaries in various ways.

Using the proper gear is essential in preventing ghost pots. Check out this video from JC NERR Education Coordinator Kaitlin Gannon to learn how you can "Rig-It-Right"!

SECTOR HIGHLIGHTS

EDUCATION

Education Coordinator: Kaitlin Gannon

LUNCH N' LEARN PROGRAMS

“Local Lenni Lenape – Then and Now”

Stockton University graduate student Taylor Ketcham discussed local South Jersey history centering around the Nanticoke Lenni Lenape Tribal Nation. Included in the discussion were highlights from the local community, including the Tuckerton middern (clam shell mound) and a past archeological site of the area.

“Sand, Sea and More Sand: Walking all 139 Miles of the Jersey Shore”

This past summer, Jersey Shore author and expert R.C. Staab walked the entire 139 miles of the Jersey Shore coastline from Sandy Hook to Cape May, exploring and then writing about each beach, promenade and boardwalk. Staab led attendees through a photo series capturing one spring and summer along the Jersey Shore.

“12 Months of Birding New Jersey”

Local nature photographer & birding enthusiast Sue Puder joined us to provide attendees with some insider information on what birds you can expect to see in New Jersey throughout the year. Location and seasonal migration make vast differences in finding various species in the Garden State.

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SECTOR HIGHLIGHTS (CONT.)

EDUCATION

Education Coordinator: Kaitlin Gannon

OTHER FALL EDUCATION PROGRAMMING

(These programs were in-person and outside only, with a limit of 20 people or less.)

“Catch of the Day”

Kaitlin Gannon led attendees on a fun afternoon of catching marsh critters! Using a seine net and small dip nets, Kaitlin guided two families through a hands-on exploration of the marsh edge to see what kinds of invertebrates and fish may live there. Along with identifying caught critters, the session also touched upon marsh biodiversity and the food web.

“Halloween Night Hike”

The Halloween Night Hike returned to the JC NERR this year! Last held back in 2019, this event provided attendees with the chance to see our Grassle Marsh Trail in a way they have never seen before. Starting at dusk, Kaitlin Gannon led attendees through our ½ mile trail while discussing different nocturnal creatures that may inhabit the area. There was also a short stop on our observation boardwalk overlooking the marsh for some star-gazing. We were very grateful to be able to host this event again, and look forward to continuing to host this event on an annual basis!



HALLOWEEN NIGHT HIKE FLYER

[CLICK HERE TO CHECK OUT OUR WINTER PUBLIC PROGRAMS!](#)

RESEARCH & STEWARDSHIP

Research Coordinator: Thomas Grothues

START OF ORSTED SAMPLING

A Rutgers project under the direction of Thomas Grothues began sampling for an assessment of offshore wind farm construction and operation on fisheries resources in December. Two days at sea in and around the proposed wind farm site allowed water sampling for the collection of environmental DNA (eDNA) by project partners from Monmouth University while the Rutgers team collected video of pelagic fish distribution and listened for tagged fish.



SPINY DOGFISH - ONE OF MANY TO VISIT THE CAMERA

AFS (AMERICAN FISHERIES SOCIETY) MEETING IN BALTIMORE

Grothues attended the American Fisheries Society meeting in Baltimore to present on BOEM-sponsored analysis of fish distribution related to offshore sand resources. Sand is second only to water in demand as a construction and shore protection material, but is an important structuring of fish habitat, including those that migrate between the ocean and estuary. Two students also attended with him as part of a commitment to mentoring.

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RESEARCH & STEWARDSHIP (CONT.)

Research Coordinator: Thomas Grothues

RARITAN FISH ASSEMBLAGE TALK AT R3C

Grothues presented at the Rutgers University Raritan Consortium (R3C) on the fish assemblage of the lower Raritan River, from its mouth to the head of freshwater just adjacent to the Rutgers New Brunswick campus. See [presentation slides](#) for more information.

SWMP Technician and Field Researcher: Gregg Sakowicz

CONTINUED WORK ON LONG-TERM PROJECTS

RESEARCH HIGHLIGHTS

During this quarter, Sakowicz began the process (training, operation, inspections, and upgrades) of re-acquiring the SWMP meteorological station that was previously sub-contracted to Stockton University. In addition, he initiated a collaborative effort with Dr. Elizabeth Lacey of Stockton University in extraction, provision, and merging/synthesis of the JC NERR's historical SAV data with more recent data collected by Stockton and the Barnegat Bay Partnership. Gregg was also appointed as Vice-chair for the Barnegat Bay Partnership Science and Technical Advisory Committee (STAC).

Sakowicz also worked with the Lavallette Elementary/Middle School for their Career Day (approximately 50 students) as well as their "Science at the Beach" and "Science Aboard" events, discussing principles of environmental and fisheries science, stock management, regulations, etc.



JUVENILE CATFISH FOUND ON DATALOGGER & SAFELY RELEASED



PC: TAYLOR ARMSTRONG



Margaret A Davidson Graduate Fellow: Taylor Armstrong

In October, graduate student Taylor Armstrong finished the first year of her two-year research project at JC NERR through the NOAA Margaret A. Davidson fellowship. Taylor is studying how land cover, and corresponding water quality variables, impact phytoplankton community composition and the presence of toxic algae in two New Jersey estuaries. During Taylor's monthly trips to New Jersey, she sampled twelve sites along the freshwater-marine continuum of Mullica River-Great Bay and Toms River-Barnegat Bay. These sites included the SWMP sites mentioned above, and other sites regularly sampled by NJDEP and BBP. At each site, Taylor took a phytoplankton net tow sample, grab samples, and put out resin bags to bind algal toxins during the month-long deployment.

So far, the six months of processed data indicates Chlorophyll a, a proxy for algal density, has a negative correlation to phenolic content in the water. The phenolic content primarily comes from the pinelands and are potential algicides.

She presented a poster about this work at the annual NERRs meeting at the beginning of November. She is traveling to the Virginia Institute of Marine Science next month to analyze the resin bags to identify what algal toxins are present in the two estuaries, and when they occur.

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RESEARCH & STEWARDSHIP (CONT.)

SWMP Assistant Technician: Patricia McHugh

SWMP VEGETATION MONITORING

One component of SWMP is long term monitoring of estuarine vegetation communities. This is “a monitoring element within the NERRS Sentinel Sites Application Module - 1 (SSAM-1) titled Coastal Habitat Response to Page 5 of 41 Changing Water Levels: NERRS Sentinel Site Application Module I (2016)” (taken from veg monitoring SOP). This monitoring is performed every 3-5 years, in which 9 Transects with 10 plots each are tracked throughout the estuary. We look at percent cover, shoot density, and canopy heights of species identified and monitor during the annual maximum biomass for the marsh plant community in the study area. This year, monitoring was conducted in late August/early September.

Corrections needed to be made to historical metadata, and in doing so it was discovered that there were some inconsistencies in the way the Transects were sampled in the past. There were maps developed via GIS that were established before the sampling started in 2011 that identified a uniform numbering system for how the plots would be sampled. Patty worked through the raw data sheets and compared them to these GIS maps to ensure that the correct nomenclature was assigned to the correct plots. This was achieved by looking at any notes included on the data sheets (like “marsh pool” or “creek edge”) and comparing plant species identified in each transect/plot across sampling events. Knowledge from this year’s sampling event was beneficial, because it was known that certain plants are more common at a creek edge than close to a road or further into the marsh. The nomenclature for 2011 and 2013 were corrected as 2017’s sampling event was done correctly and according to the GIS maps. Corrections were also made in the metadata afterwards to reflect the changes made, and to clarify sampling procedures.

MET STATION AND OTHER PROJECTS

Another component of SWMP is maintaining a MET station, or meteorological tower. The tower that the JC NERR oversees is located at Stockton University Marine Field Station and is telemetered, so live data can be seen. Patty has been working with Gregg Sakowicz and Gina Petrezulli from Stockton to maintain the station and download/QAQC the data on a monthly basis. A link to the live data can be found [here](#) under “JACNCMET”. The live data the JC NERR water quality station is located next to it as well under “JACB6WQ”.

In addition to main SWMP duties with nutrient sampling and water quality data logger swaps, Patty has provided assistance to other members of the Research team with projects when needed. For example, she assisted Andrea in the Tea Bag Decomposition project (being done across the NERRS) by pulling tea bags from the marsh and weighing their contents to determine rate of marsh decomposition. Patty also assisted Thomas Grothues in reviewing GoPro trawling video in connection with the Orsted wind project to see if any pelagic fish were recorded.

Stewardship Coordinator: Andrea Habeck

CONTINUED WORK ON LONG-TERM PROJECTS

STEWARDSHIP HIGHLIGHTS - ALL-HAZARDS DISASTER RESPONSE TRAINING: FIRST AID AND CPR

Building on a previous disaster response planning effort, the Jacques Cousteau Reserve hosted joint staff training with JC NERR and Rutgers partners to exercise elements of the Disaster Response and Recovery Plan. This activity supported the next step in building capacity and a proper response posture for natural and human-caused disasters. Periodically conducting plan exercises and training are critical for building preparedness and refining contingency planning.

The exercise focused on one of the priority hazards identified in reserve response and recovery plan’s Hazard Identification and Risk Assessment (HIRA), Medical Emergencies. The CPR and First Aid training enhanced NERR staff readiness for handle emergencies at the JC NERR buildings and in the field.

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SANDY HOOK COOPERATIVE RESEARCH PROGRAM

Team: Norb Psuty, Andrea Habeck, Chris Menke, Anabel Rosero

The Sandy Hook Cooperative Research Program is supported by the Jacques Cousteau National Estuarine Research Reserve (JCNERR) and directed by Dr. Norbert Psuty, Professor Emeritus at Rutgers University. The research and monitoring that is conducted is part of Cooperative Ecosystems Studies Unit (CESU) of the North Atlantic Region and is addressing a variety of National Park Service and US Fish and Wildlife Service resource and management issues. Shoreline position and beach/dune morphology have been identified as the highest priorities as vital signs to be monitored within the National Park Service. In accordance with the direction from the National Inventory & Monitoring program in the NPS, Dr. Psuty and team created three fully-developed protocols for tracking shoreline position dune/beach topography with GPS technology. These protocols are part of the Northeast Coastal Barrier Network and have also been adopted by the Southeast Coast Network, Gulf Coast Network, and over 11 US Fish and Wildlife Refuges in the Northeast Region.

CURRENT PROJECTS

- Evaluation of Dune and Beach Restoration and Resilience at Selected Sites in the Mid-Atlantic Region
- Coastal Geomorphological Monitoring and Change Analysis: Application of the Monitoring Protocols at Gateway National Recreation Area; Trend reports at Assateague National Seashore, Gateway National Recreation Area, and Fire Island National Seashore; Evaluation of Coastal Impacts at Gateway National Recreation Area
- Off-Road Vehicle Regulations to Support Resilience of Fore-dune-Beach System in Fire Island National Seashore

AWARDED AND PENDING GRANTS

AWARDED

- “Barnegat Bay and Great Bays Resilience Observing Network: Tracking the Changing Environment to Inform the Management of Estuarine Resources”: Project to be funded via the newly-established New Jersey Consortium for Resilient Communities which includes the JC NERR, Rutgers University, Monmouth University, Stevens Institute of Technology, Stockton University, NJ Sea Grant Program, Montclair University, and the NJ Institute of Technology. PIs from the JC NERR on this project: Michael De Luca (Manager), Andrea Habeck (Stewardship Coordinator), and Amy Plantarich (Communications and Outreach Coordinator)

PENDING

- MARACOOS proposal to the FY 2021 Implementation of the U.S. Integrated Ocean Observing System Federal Funding Opportunity NOAA-NOS-IOOS-2021-2006475.: By expanding the National Estuarine Research Reserve (NERR’s) System-wide Monitoring Program (SWMP) to incorporate pCO₂ sensors in distinct geographical regions (coastal bay, bay, and tidal tributary) near aquaculture lease areas and commercial shellfish beds, the Mid-Atlantic Regional Council on the Ocean (MARCO), the Delaware NERR (DNERR), and the Mid-Atlantic Coastal Acidification Network (MACAN) in partnership with Center for the Inland Bays (CIB), Barnegat Bay Partnership (BBP), Delaware Sea Grant (DESG), Delaware State University (DSU), Delaware Department of Natural Resources and Environmental Control (DNREC), and the Jacques Cousteau NERR (JCNERR), aim to build capacity for long-term, continuous monitoring of water quality and coastal acidification in the Delaware Bay, Barnegat Bay, and Delaware’s Inland Bays.
- Gregg Sakowicz in contribution to collaborative NERRS proposal “Developing a predictive model framework for seagrass ecosystems and climate stressors to promote ocean resilience” (Funding Opportunity Number: NOAA-NOS-NCCOS-2022-2006972); This project proposes to evaluate existing seagrass and water quality data and collect new experimental and environmental data to develop predictive tools for place-based management under future climate scenarios. The proposed research will focus on seagrass that supports recreational and commercial species in NOAA’s National Estuarine Research Reserve System (NERRS) under multiple simultaneous stressors including harmful algal blooms (HABs), hypoxia, temperature, and ocean acidification (OA).