

A person wearing a blue hard hat, a black face mask, an orange jacket, and a life vest is standing on the deck of a boat. The life vest has "West Marine" written on it. The person is looking out over a blue ocean with white-capped waves. In the sky, many birds are flying. The text "2020 Annual Report" is overlaid in the top right corner.

▶ 2020 Annual Report

MONMOUTH
UNIVERSITY

URBAN COAST INSTITUTE



Our Mission

To serve Monmouth University and the public as a forum for **research**, **education** and **collaboration** in the development and implementation of science-based policies and programs that support stewardship of healthy, productive and resilient coastal ecosystems and communities.



2005

15
YEARS

2020



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Karl Vilacoba
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Monmouth University President Emeritus

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*Rechnitz Family/Urban Coast Institute
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Faculty Fellows

Kimberly Callas, M.F.A.
Artist in Residence

Megan Phifer-Rixey, Ph.D.
Marine Genetics Fellow

▶ A Time to Reimagine a Better Tomorrow

Last January, the events of the past year would quite literally have been unimaginable. Most of us have been more isolated, working from home or out of work; trying to balance demands of family and what it means to be “socially distant.” The race for the vaccine, the presidential race, the seemingly sudden but long simmering demand for racial justice. News of wildfires, hurricanes, and melting glaciers feeding the drumbeat of a climate crisis. Stories of heroes, communities overcoming odds and simple acts of kindness help to quell but do not dispel our fears, fueled by political division and an eroding social contract. The best we can do many days is to remind ourselves of the 1939 pre-war British entreaty—*Keep Calm and Carry On*.

As outlined in this report, the Urban Coast Institute (UCI) has carried on and thrived despite the circumstances. While many aspects of our lives have been on hold, there are pervasive calls to reset and reimagine a better future. We are fortunate to have the ocean and Jersey Shore as an expansive and inspirational palette for our work. There is also no place better for reimagining our future than at a university.



Simply returning to normal will not be sufficient to address the aspirations of our students and the needs of the next generation. Throughout this report there are examples of work by students, faculty, the UCI and our partners creating knowledge, conducting studies and crafting strategies that will support community recovery, environmental protection and social equity—a better tomorrow.

We have reached into the past, supporting the work of students and faculty in the search and discovery of a Revolutionary War wreck. With support from the Jules L. Plangere, Jr. Family Foundation we have hired our first community science coordinator to expand our work with local volunteers to monitor the health of coastal lakes. Monmouth students whose research the UCI has supported have been selected for prestigious national fellowships.

The R/V Heidi Lynn Sculthorpe continued to ply the waters, supporting classes and research projects. Although we were unable to get together in person in 2020 for our annual Future of the Ocean Symposium and Champion of the Ocean Awards, we launched the Marine and Environmental Speaker Series and the Global Ocean Governance Series in collaboration with the Institute for Global Understanding, which “virtually” brought leading experts from across the U.S. and the world to campus. We look forward to seeing you in person in 2021.

UCI projects have an impact at the local, state, regional and national level. We are particularly proud of our commitment to increase attention on diversity, equity, inclusion and justice. We supported the research of a student who examined past and current discriminatory beach access practices in New Jersey, and projects by Monmouth faculty documenting the racial history in Asbury Park. Monmouth President Emeritus and UCI Ocean Policy Fellow Paul G. Gaffney II was appointed to a National Academy of Sciences Committee that will expand defense research opportunities at Historically Black Colleges and Universities.

UCI Associate Director Thomas Herrington continues to be a leader in state and community efforts to adapt to sea level rise and coastal storms, receiving the Mid-Atlantic Sea Grant's Outstanding Outreach Award, and serving on the New Jersey Department of Environmental Protection's Coastal Ecological Restoration and Adaptation Planning Committee.

With ongoing support from the Gordon and Betty Moore Foundation, the UCI continues its work on regional ocean planning, including supporting the Mid-Atlantic Committee on the Ocean (MACO), stakeholder workshops and enhancement of the Mid-Atlantic Ocean Data Portal. Expanding on my work as a member of the National Academy of Sciences (NAS) Ocean Studies Board, I was appointed as a member of the NAS National Committee for the U.N. Decade of Ocean Science for Sustainable Development. The National Committee's charge is to encourage U.S. leadership and international partnership, and help

innovative, multi-disciplinary and transformative research over the next decade."

In his poem *Sea Fever*, John Masefield captured well our yearning to return to the sea, to reconnect and to leave some of the current darkness behind us.

*I must go down to the seas again, to
the lonely sea and the sky,*

*And all I ask is a tall ship and a star
to steer her by,*

*And all I ask is a merry yarn from a
laughing fellow-rover,*

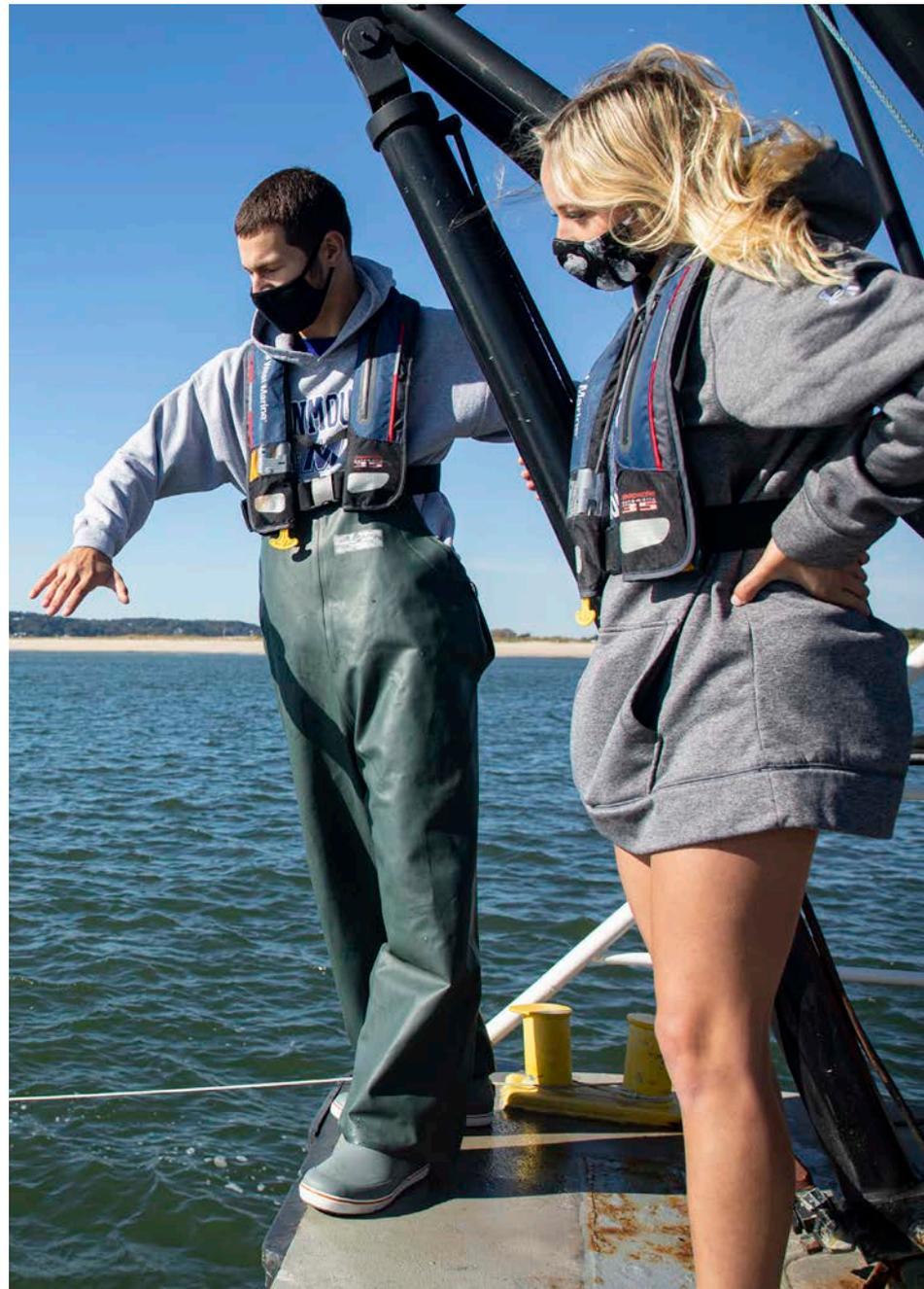
*And quiet sleep and a sweet dream
when the long trick's over.*

Take care ... quiet sleep and sweet
dreams ahead!



TONY MACDONALD

Director, Urban Coast Institute



▶ A 2020 Vision: Excellence in Challenging Times

From kindergarten to the graduate level, educators have never endured a year like 2020. The daily cascade of discoveries about COVID-19 necessitated frequent adjustments to safety guidelines and the physical arrangement of learning spaces. Local case fluctuations and varying government mandates forced administrators, faculty and students to bounce from in-person to hybrid to all-virtual classes and back, sometimes in the space of days.

Under the leadership of President Patrick Leahy and Monmouth's dedicated staff, the University navigated this unprecedented challenge, maintaining



“At a time when many aspects of the traditional campus experience and daily life were upended, the UCI provided students access to invaluable opportunities for research, collaboration and engagement.”

student safety and the excellence in instruction they expect from a Monmouth education. At a time when many aspects of the traditional campus experience and daily life were upended, the UCI provided students access to invaluable opportunities for research, collaboration and engagement, while making important impacts in coastal communities.

As the pandemic took hold, UCI Marine Scientist and *R/V Heidi Lynn Sculthorpe* captain Jim Nickels moved quickly to establish safety protocols that would enable research activities on Monmouth's vessels and in the field to continue. This made it possible for students and faculty to collaborate in person throughout the summer on innovative projects funded through the Heidi Lynn Sculthorpe Scholars program (see page 8). The UCI also provided a special round of fall grants for projects geared toward advancing diversity, equity, inclusion and justice goals in coastal communities (page 13).

With its history of facilitating successful webinars, the UCI was well positioned to pivot from hosting educational events on campus to online ones that acquainted thousands of participants with Monmouth (page 19). A new Global Ocean Governance Lecture Series, organized jointly by the UCI and Institute for Global Understanding, drew attendees and panelists from around the globe.

The UCI's citizen science initiatives thrived through the pandemic (page 12). Questions about whether Coastal Lakes Observing Network volunteers would continue sampling at the start of the pandemic subsided quickly, as many embraced the task as a chance to get out of the house and experience nature.

This publication offers a small snapshot of the UCI's impacts in 2020—a year the likes of which we'll always be proud, but hope never to repeat.

2020 Student and Faculty Support at a Glance

Research Vessel Student Activities

HEIDI LYNN SCULTHORPE

150 total students aboard

32 class/research/
contract work days



LITTLE HAWK & SEAHAWK

42 total students aboard

43 class/research/
contract work days



STUDENT AND FACULTY GRANTS

14

FACULTY RESEARCHERS SUPPORTED

11

HEIDI LYNN SCULTHORPE
STUDENT RESEARCH GRANTS

2

SUSTAINABILITY AMBASSADORS

1

GRADUATE STUDENT RESEARCH ASSISTANT



▶ Heidi Lynn Sculthorpe Scholars: Getting Out of Their Shells and Into the Field

On a sunny July morning, Assistant Professor Sean Sterrett and students Angel Ireland and Sara Grouleff waded into the waters of Long Branch's Takanassee Lake and checked a group of nets stationed around its perimeter. Time after time, they emerged holding red-eared slider turtles—a common pet species that is not native to New Jersey.

“It’s a species that people get when they’re teeny-tiny, and then they outgrow their aquarium and get stinky,” Sterrett said. “Then people try to figure out what to do with this turtle, and they think the best thing to do is drop it in a lake.”

Over the years a fully functional population of red-eared sliders bloomed in the lake, to the point where they may now be the system’s most common species. This was one of the findings from the team’s research on how turtle populations survive and adapt in lake environments within densely populated areas. The project that was supported through the UCI’s Heidi Lynn Sculthorpe Summer Research Program.



About the Program

The program offers students (Heidi Lynn Sculthorpe Scholars) access to grant funding to carry out projects of their own design under the guidance of faculty mentors. Each year, the program supports several hands-on research projects that provide real world experience to students while helping make a positive impact in coastal communities. The UCI thanks the many individual and corporate donors whose support made this work possible.



2020 Heidi Lynn Sculthorpe Scholars Summer Research Projects

Adapting to Protect the North Atlantic Right Whale from Climate Change

Student: Aidan Bodeo-Lomicky

Faculty Mentor: Randall Abate, Rechnitz Family/UCI Endowed Chair in Marine and Environmental Law and Policy

Aerial Drone Survey and 3-D Model Construction of Crosswicks Creek, New Jersey, Colonial Shipwreck Site

Student: Bre DiRenzi

Faculty Mentor: Geoff Fouad, Department of History and Anthropology

Beach Access and Race Discrimination in New Jersey

Student: London Jones

Faculty Mentor: Randall Abate, Rechnitz Family/UCI Endowed Chair in Marine and Environmental Law and Policy

Ecotherapy: Nature as a Co-Therapist

Student Researcher: Nicole Owenburg

Faculty Mentor: Megan Delaney, Department of Professional Counseling

Harmful Algal Blooms in Monmouth County Coastal Lakes, Estuaries, and Ocean

Student Researchers: Karly Nolan and Skyler Post

Faculty Mentor: Jason Adolf, Department of Biology

Post-COVID Reset: Recommendations for Ocean-Climate Action and a Sustainable Blue Ocean Economy for New Jersey

Student Researcher: Johanna Vonderhorst

Faculty Mentor: UCI Director Tony MacDonald

Reptile and Amphibian Ecology and Conservation in Urbanized and Suburbanized Ecosystems

Student Researchers: Sara Grouleff and Angel Ireland

Faculty Mentor: Sean Sterrett, Department of Biology

Using Artificial Intelligence to Track the Environmental and Economic Consequences of Climate Change

Student Researcher: Avery Jackson

Faculty Mentor: Katie Gatto, Department of Computer Science

Using eDNA as a Tool for Understanding Our Coastal and Estuarine Communities

Student: Cameron Gaines

Faculty Mentor: Megan Phifer-Rixey, Department of Biology/UCI Marine Genetics Faculty Fellow



Graduate Research Assistant: Lisha Samuel

Lisha Samuel received UCI funding in the fall for a research project on climate change communication in India. She completed her project under the guidance of Rechnitz Family/UCI Endowed Chair in Marine and Environmental Law Randall Abate and presented it at the University's Climate Crisis Teach-In in October. Lisha plans to pursue a career in communications and public relations.

Student Sustainability Ambassadors

UCI sustainability ambassadors connect students with the Monmouth University Sustainability Advisory Council (SAC) and promote environmental initiatives on campus. They also work to build a University-wide network that includes students, faculty and staff who advocate sustainability on campus through teaching, research, engagement, and operational improvements.

The UCI supported two of these paid student positions in the spring of 2020, held by Shannon Harris and Selena Harrichand. Ambassadors report to UCI Associate Director Thomas Herrington, who co-chairs the SAC.

NOAA Hollings Scholars

Three UCI-supported students went on to earn the National Oceanic and Atmospheric Administration's prestigious Ernest F. Hollings Undergraduate Scholarship in 2020. Congratulations to Aidan Bodeo-Lomicky, Hannah Craft, and Johanna Vonderhorst for their achievement.

▶ The R/V Heidi Lynn Sculthorpe: Advancing Partnerships (and Saving Whales)

UCI Marine Scientist Jim Nickels was finishing up paperwork in his office one morning in July when he got an emergency call from the National Oceanic and Atmospheric Administration (NOAA). A humpback whale had been spotted off the coast of Rockaway, New York, tangled in what was later determined to be 4,000 pounds of commercial fishing gear. NOAA was looking for any available partners with vessels and equipment that could help save the whale's life.

Nickels boarded Monmouth University's Research Vessel *Heidi Lynn Sculthorpe* and rushed to the scene, where a team of state and federal agencies and nonprofit organizations worked together over the course of four days to free the animal. Nickels used the *Heidi Lynn's* powerful net reel to raise the gear to the surface, allowing the whale to breathe easier until the trawl net and cables could be hoisted completely out of the water and severed. With the success of the mission, Monmouth is now on a list of on-call partners for future marine mammal rescues.

Monitoring Waves & Hurricanes

Since its acquisition in 2018, the *Heidi Lynn* has opened the doors for Monmouth faculty to collaborate with numerous academic institutions, government agencies and NGOs on scientific research. These projects have provided students with valuable opportunities for hands-on field experience.



At the start of hurricane season, the UCI partnered with the Navy, Mid-Atlantic Regional Association Coastal Ocean Observing System, Rutgers University and other organizations to launch a pair of autonomous gliders that collected data on the interactions between the ocean and powerful storms that passed through the New York Bight. A particular focus was the influence that cooler waters at the bottom of the ocean have on storms once they "upwell," or rise to mix with warmer surface waters as the ocean churns.

The *Heidi Lynn* was also used to deploy a buoy programmed to transmit real-time data on waves and sea temperatures about 13

miles east of Barnegat Bay. The buoy joined a national network of stations operated by the Coastal Data Information Program, based at the Scripps Institution of Oceanography, to provide coastal engineers and planners, scientists, mariners and the public with a wealth of data that can inform their research and decision-making.

We are grateful to former Monmouth University Board of Trustees Chair **Robert B. Sculthorpe**, **George Kolber** and the **Fairleigh Dickinson, Jr. Foundation**, whose generous support has ensured the ongoing maintenance and operations of the *Heidi Lynn*.



Maritime Archaeology Course Leads to a Revolutionary Find

In 1777, British forces at Philadelphia set out to destroy a fledgling Continental navy composed of converted merchant ships. Many of these vessels were hidden in creeks and streams that feed the Delaware Bay and were either seized or torched when found.

Among them was a 42-foot galley that was burned near the mouth of Crosswicks Creek in Bordentown, New Jersey. Small sections of the wreck were visible during very low tides, but the remains continued to sink in the mud and erode from the elements, and no signs of it had been recorded in decades. The lost wreck was found in 2020, thanks to the efforts of graduate student Jaclyn Urmeý.

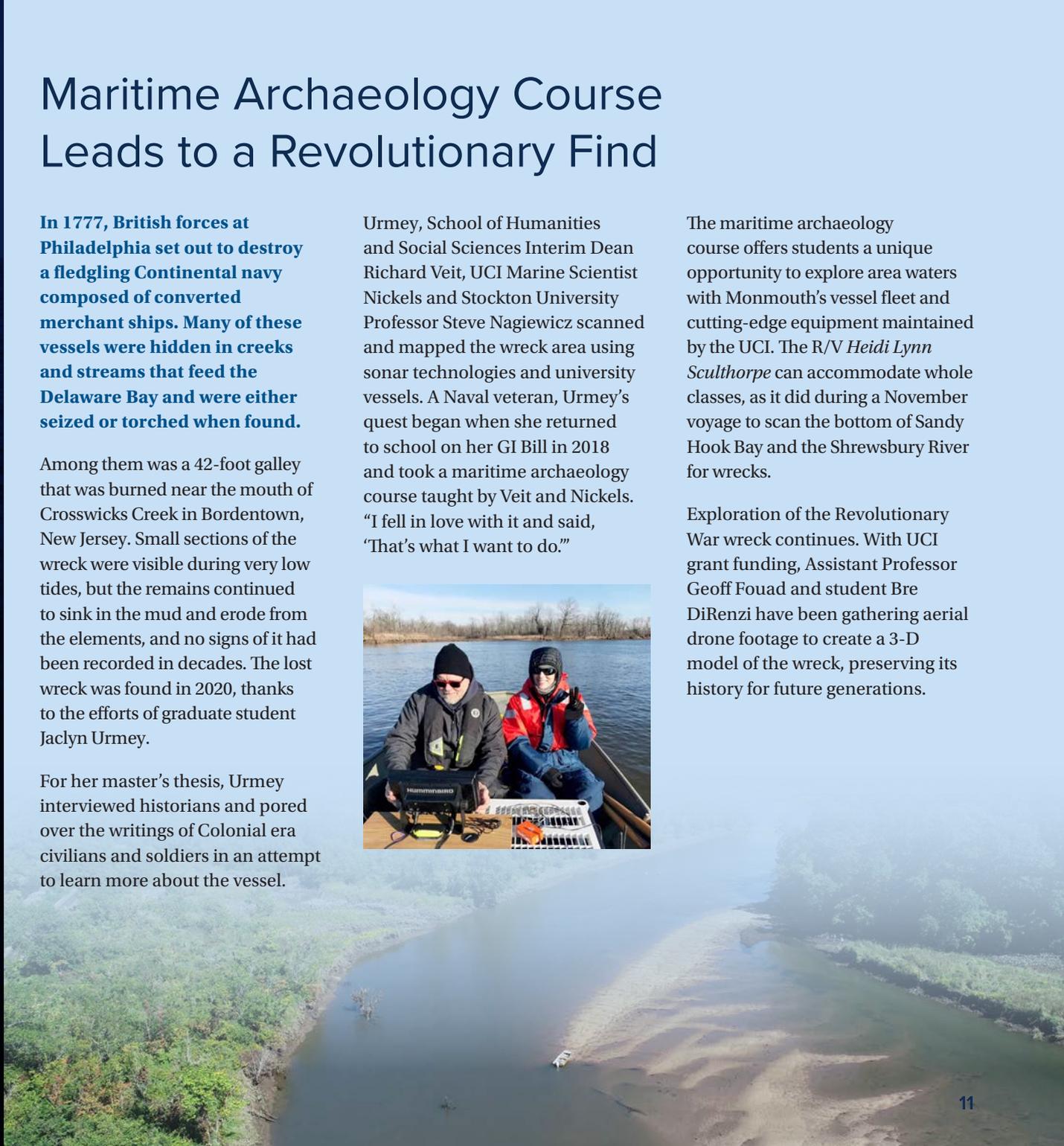
For her master's thesis, Urmeý interviewed historians and pored over the writings of Colonial era civilians and soldiers in an attempt to learn more about the vessel.

Urmeý, School of Humanities and Social Sciences Interim Dean Richard Veit, UCI Marine Scientist Nickels and Stockton University Professor Steve Nagiewicz scanned and mapped the wreck area using sonar technologies and university vessels. A Naval veteran, Urmeý's quest began when she returned to school on her GI Bill in 2018 and took a maritime archaeology course taught by Veit and Nickels. "I fell in love with it and said, "That's what I want to do."



The maritime archaeology course offers students a unique opportunity to explore area waters with Monmouth's vessel fleet and cutting-edge equipment maintained by the UCI. The R/V *Heidi Lynn Sculthorpe* can accommodate whole classes, as it did during a November voyage to scan the bottom of Sandy Hook Bay and the Shrewsbury River for wrecks.

Exploration of the Revolutionary War wreck continues. With UCI grant funding, Assistant Professor Geoff Fouad and student Bre DiRenzi have been gathering aerial drone footage to create a 3-D model of the wreck, preserving its history for future generations.



▶ Providing Stewardship of Citizen Science Initiatives

The UCI has enlisted the enthusiastic assistance of the people who live, work and play in our coastal communities in order to confront pressing environmental issues. Through the UCI's citizen science initiatives, Monmouth faculty and students provide local volunteers with the training and equipment necessary to gather data that can reveal important trends in their environment.

Endowed Associate Professor in Marine Science Jason Adolf coordinates the Coastal Lakes Observing Network (CLONet), an innovative effort that is examining the prevalence and causes of harmful algal blooms (HAB) in Monmouth County seaside lakes. Residents in the lake communities collected and filed the results of over 450 water quality samples via an online app by year's end, supplying Adolf with data that can help diagnose and predict HAB events in the future.

The HAB issue has gained increased statewide attention due to lengthy closures at summer tourism destinations such as Lake Hopatcong and Greenwood Lake that have strained local economies. Adolf was selected to lead a HAB Experts Team launched by Gov. Phil Murphy to help improve the state's capacity for dealing with the blooms.

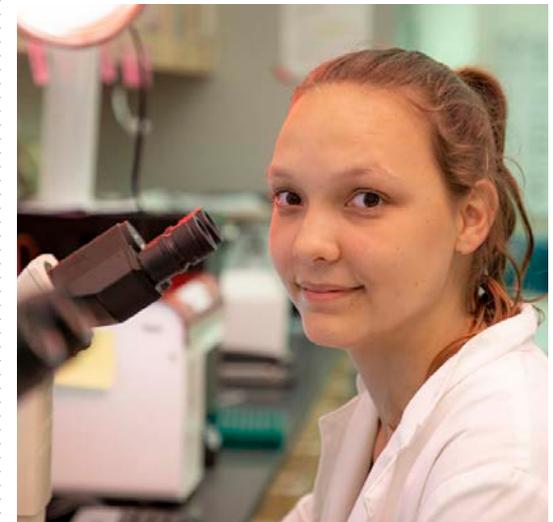


Battling Flooding in Ocean City

UCI Associate Director Thomas Herrington worked with a grassroots community group in Ocean City, New Jersey, to examine the causes of chronic flooding and identify long-term solutions that would remain effective in the face of sea level rise and climate change. Herrington trained residents of the barrier island town to conduct citizen science work and pool their data using an app developed by iSeeChange. Herrington's efforts were recognized in 2020 with the Mid-Atlantic Sea Grant Region's Outstanding Outreach Award.

UCI Citizen Science Coordinator

The CLONet project has been made possible by the **Jules L. Plangere, Jr. Family Foundation**, which funded the purchase of sampling kits for community volunteers and the hire of Erin Conlon as the UCI's first citizen science coordinator. A 2020 Monmouth graduate, Conlon was a member of the Phytoplankton and Harmful Algal Blooms Research Lab, where she led summer research projects focused on the Shrewsbury and Navesink rivers and assisted on studies related to water quality in local beaches and lakes.



A Commitment to Diversity, Equity, Inclusion and Justice

Americans will long remember 2020 as a time when the nation faced a deadly pandemic, economic hardship and a succession of tragedies that compelled us to consider how deeply ingrained racial injustice remains in society. While these issues may appear far removed from the UCI's day-to-day work, we recognize that environmental justice communities—including those of low income, communities of color, immigrant groups, and Indigenous peoples—bear a disproportionate share of the burden of marine pollution, coastal storms and sea level rise, as well as uneven access to and distribution of benefits from the ocean. The UCI is dedicated to being part of the solution and took steps throughout the year to ensure its work reflected its commitment to diversity, equity, inclusion and justice.

The UCI issued a special call for proposals to support faculty and student research and community-based projects focused on sustainably rebuilding coastal communities and economies after the pandemic while addressing impacts to and needs of our most vulnerable populations. Heidi Lynn Sculthorpe Faculty Enrichment Grants were awarded for projects that will create Little Free Library installations in low-income coastal communities and study COVID-19's impacts on the African American community in Asbury Park, New Jersey. With the support of a UCI summer research grant, student London Jones prepared a paper on historic discriminatory barriers to beach access in New Jersey.

Former Monmouth University President and UCI Ocean Policy Fellow Paul G. Gaffney II joined the National Academies of Sciences, Engineering and Medicine's Committee on Defense Research at Historically Black Colleges and Universities and other Minority Serving Institutions. Gaffney, a retired Navy vice admiral, is working with the committee to examine the methods and means necessary to advance research capacity at those institutions to address national security and defense needs.

UCI Artist-in-Residence and Faculty Fellow Kimberly Callas continued to develop her Discovering the Ecological Self program (discoverecoself.org), which provides at-risk youth opportunities to take field visits and classroom lessons focused on nature-based topics, explore them from philosophical and cultural perspectives, and create works of art inspired by them. These activities will continue in the year ahead as COVID-19 safety considerations permit.

2020 DEIJ FACULTY ENRICHMENT GRANTS

Nourishing Book Deserts: Providing Access to Authentic and Relevant Interdisciplinary and Inclusive Books for Coastal Communities

Faculty Researchers: Kenneth Kunz, Jason Fitzgerald and Michelle Schpakow, Department of Curriculum and Instruction; Kurt Wagner, Monmouth University librarian; and Lori Burns, Department of Educational Counseling and Leadership

Paradoxical Paradise: Asbury Park, an African American Oral History and Mapping Project

Faculty Researchers: Hettie V. Williams, Geoffrey Fouad and Melissa Ziobro, Department of History and Anthropology



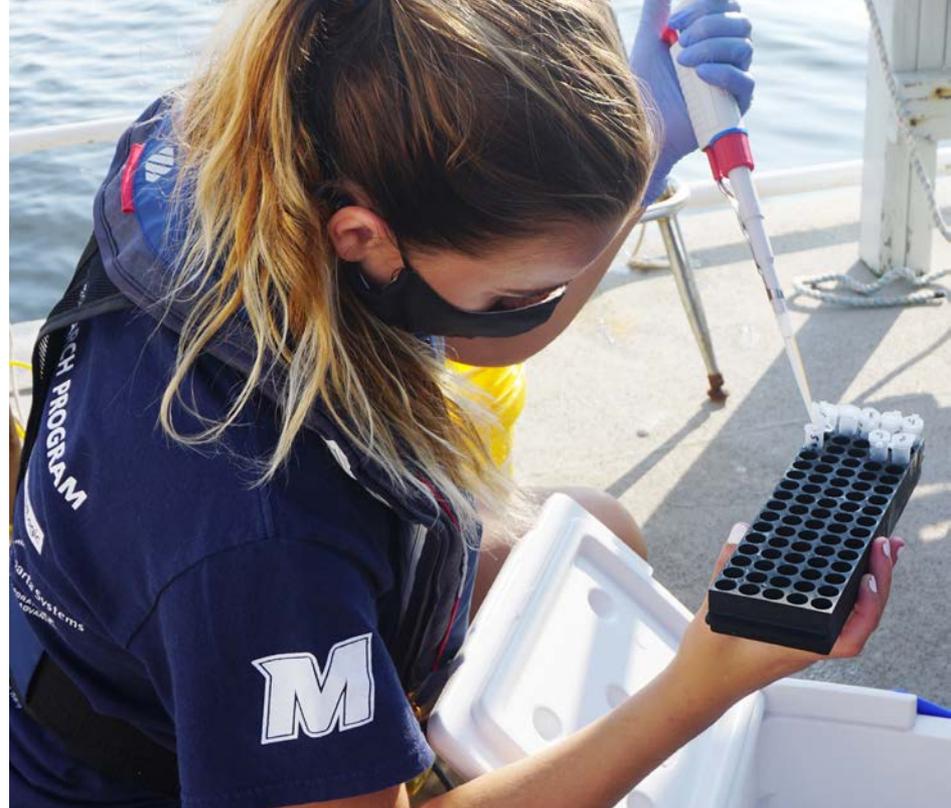
▶ Taking the Census through Genetics

It wasn't just a Census year for humans living at the Jersey Shore. The UCI led multiple projects last year focused on gathering data on the demographics of marine organisms with addresses along our coast.

With grant support from the **Achelis and Bodman Foundation**, a student and faculty research team began a project that will entail six research cruises per year to learn more about the populations of fish, phytoplankton and benthic organisms living in the Sandy Hook and Raritan bays. The team conducts fish trawls, water sampling and sediment collection on these trips, and then filters water samples in the lab for trace genetic materials—known as marine environmental DNA, or eDNA—that can signal the presence of additional organisms which weren't physically observed.

Monmouth has been a pioneer in research on eDNA's potential for augmenting or supplanting traditional methods for studying marine life populations. Monmouth faculty have partnered on several research projects with the Rockefeller University and the institutions co-hosted a National Conference on Marine Environmental DNA in New York City in 2018. School of Science Assistant Professor Megan Phifer-Rixey has advanced this research in her work as the UCI marine genetics faculty fellow.

The Monmouth-Rockefeller research partnership culminated with the publication of a 2020 study with scientists from the New Jersey Department of Environmental Protection (NJDEP) that holds groundbreaking implications for fisheries management. The team found that the amount of fish DNA in water samples collected during the NJDEP's trawls closely corresponded to the kilos of fish captured in their nets. The finding shows that eDNA—a cheaper and more humane alternative to capturing fish—could be used not only to show the presence of fish but as the potential to estimate their numbers with accuracy.



▶ Read the Monmouth/Rockefeller/NJDEP study online at monmouth.edu/uci/reports

Building a More Resilient Coast

As a coastal university located just one mile from the Atlantic Ocean, Monmouth is well acquainted with the multiprong threat of climate change. The UCI mobilizes the deep pool of intellectual capital on campus to study, combat and raise awareness of climate change through the lenses of science, public policy, arts, communications and more. As an emerging regional leader on coastal resilience issues, the UCI played a key advisory role in several new federal and state-level planning efforts in 2020.

UCI Associate Director Thomas Herrington was appointed to a national team of Sea Grant researchers focused on understanding climate change's current and future influence on residential migration from America's coastal communities. The study was launched recognizing that little attention has been paid to the prospect of mass withdrawals in the U.S., although sea level rise could force millions of residents from their homes by 2100. The three-year project is being managed by the University of Georgia and supported by a National Science Foundation grant.

The New Jersey Coastal Resilience Collaborative, co-chaired by UCI Director Tony MacDonald, led a pair of working groups focused on actions municipalities can take to improve their resilience and policies the state can enact to ensure their success. Herrington and Laura Kerr of the Stevens Institute of Technology drew upon the groups' input to craft a document containing recommendations the New Jersey Department of Environmental Protection (NJDEP) could incorporate into its climate change resilience strategy.

Herrington and GIS Program Director Geoff Fouad completed a report for the NJDEP that offers guidance for determining the appropriate type and location of green infrastructure projects designed to improve the resilience of coastal communities and ecosystems. Drawing on its findings, the NJDEP and Rutgers University are building an online tool that will help the agency prioritize where it should invest in future projects. Herrington continues to advise the NJDEP on the parameters the tool should include for ranking any projects.



Coast Guard Navigates Offshore Wind Planning with UCI Support

The first two offshore wind turbines in U.S. federal waters began generating green energy off the coast of Virginia Beach in the fall. They'll be far from the last.

In the coming decade, vast wind farms with the capacity to power millions of homes will be developed along the continental shelf from New England to Cape Hatteras. To ensure that maritime traffic remains unimpeded along the East Coast, the Coast Guard launched a series of Port Access Route Studies (PARS) to evaluate the adequacy of vessel routing measures at the approaches to major ports. A key tool for the agency's analysis and outreach was the Mid-Atlantic Ocean Data Portal (portal.midatlantic.org), a free and publicly accessible GIS site containing over 5,000 interactive maps depicting cargo traffic, fishing grounds, wildlife habitats and much more.



UCI Director Tony MacDonald and Communications Director Karl Vilacoba are members of the team that maintains the Portal for the Mid-Atlantic Regional Council on the Ocean (MARCO), a five-state consortium formed to collaborate on ocean issues. MacDonald and Vilacoba also help facilitate the Mid-Atlantic Committee on the Ocean (MACO), which consists of state, federal, tribal and fishery management entities. In addition, UCI Postdoctoral Researcher Chris Haak is working with scientists from NOAA's Sandy Hook Lab and the region's fishery management councils on a Northeast Regional Fish Habitat Assessment that will improve the Portal's marine life data. Their work is supported with grant funding from the **Gordon & Betty Moore Foundation**.

Using the Portal, the Coast Guard designed new anchorage areas that could serve vessels involved in the construction of turbines as well as a proposed system of marine corridors that ships could use to pass through the wind areas. MacDonald and Vilacoba collaborated with the Coast Guard, MARCO and MACO to host a series of webinars educating stakeholders on the studies and proposals, and how the Portal can be used to analyze and provide input on them.

Supporting the Science We Need for the Future of the Ocean We Want

The U.N. has declared 2021-2030 the Decade of Ocean Science for Sustainable Development. The U.N. Decade is a call to focus and inspire innovative and transformative scientific initiatives across the globe needed to ensure sustainable use of ocean resources and long-term ocean health.



UCI Director Tony MacDonald was named to the U.S. National Committee for the U.N. Decade of Ocean Science for Sustainable Development. The committee will encourage diverse and cross-sectoral participation, convene activities and serve as a communication channel for the U.S. ocean science community regarding national and U.N. Decade events.

The goals of the U.N. Decade, outlined below, are ambitious and will take a coordinated effort to marshal science and innovative technologies to inform and respond to the needs of society.

- A clean ocean where sources of pollution are identified and removed
- A healthy and resilient ocean where marine ecosystems are mapped and protected
- A predictable ocean where society has the capacity to understand current and future ocean conditions
- A safe ocean where people are protected from ocean hazards
- A sustainably harvested ocean ensuring the provision of food supply
- A transparent ocean with open access to data, information and technologies
- An inspiring and engaging ocean where society understands and values the ocean

To help spread the word, the UCI has also joined as an Ocean Decade U.S. Nexus Organization. As a Nexus Organization, the UCI will receive regular updates on the work of the U.S. National Committee and commit to helping share news about the U.N. Decade.

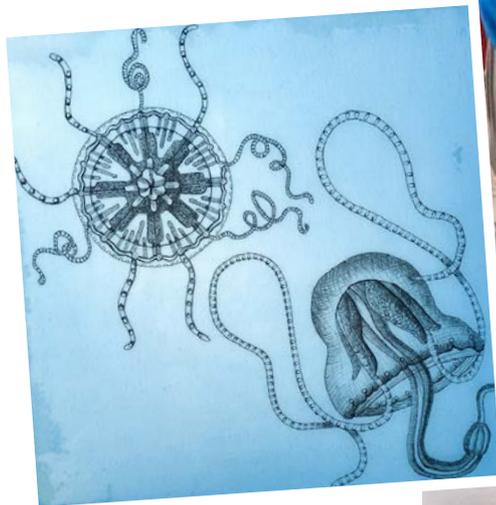
To learn more about the U.N. Decade for Science for Sustainable Development or activities of the U.S. National Committee, sign up for alerts or join as a Nexus Organization, visit the National Academies of Sciences, Engineering, and Medicine website.

▶ Viewing Microscopic Marine Life through an Artistic Lens

Before the advent of microscopic photography, it fell to the artistic skills of scientists to show the world what the invisible plants and animals in our oceans looked like. Groundbreaking sketches from centuries past continue to capture the imagination of science enthusiasts and artists, including Professor Patricia Cresson, who created over 50 works highlighting microscopic marine organisms and larger sea creatures.

Cresson's collection, *The Interface Between Marine Biology and Creative Microscopic Inhabitants of the Sea*, also drew some inspiration from the CDC's graphic artists. In the early days of the COVID-19 pandemic, she was struck by the aesthetic beauty of models showing the virus and began investigating what other infectious diseases looked like. This research eventually shifted to imagery depicting the unicellular and microscopic life forms that are abundant in our waters.

Cresson created works in a variety of mediums, including black ink drawings on watercolor paper, illustrations on wood panels and collages. She also assigned her advanced digital imaging class to create traditional collages (cut paper and materials) and then digital collages focused on marine ecosystems. The UCI provided Cresson and her students access to the project materials through a faculty enrichment grant.

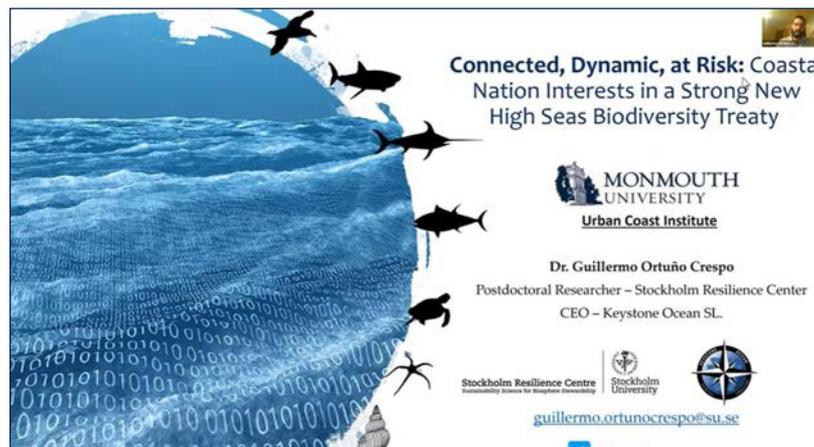


Zooming Ahead with Educational Events

Although COVID-19 made it impossible to welcome the public to campus for events, the UCI engaged a wider audience than perhaps ever before through an active schedule of virtual panels and educational lectures.

Shortly after the pandemic took hold, the UCI assembled a panel to examine the situation's implications for the environment. Scientists from the New Jersey Department of Environmental Protection and Rutgers, Stockton and Monmouth universities offered insights on how air quality, wildlife, beaches and ocean health were faring at a time when even parks and boardwalks were off limits.

The UCI forged a partnership with Monmouth's Institute for Global Understanding (IGU) to launch a **Global Ocean Governance Series** covering scientific and policy issues that hold important implications for coastal and marine ecosystems. Viewers from around the globe tuned in for discussions on an international high seas biodiversity treaty and how ocean alkalization could help combat climate change. The panels were moderated by



Rechnitz Family/UCI Endowed Chair in Marine and Environmental Law Randall Abate, who also helped organize multiple UCI **Marine and Environmental Speaker Series** guest lectures geared toward student audiences. Speakers explored federal actions that could boost the commercial seaweed industry and blue economy and guard against climate change impacts to the oceans.

The University hosted a weeklong "Wake Up to Climate Change" Climate Crisis Teach-In series in the fall that included nearly a dozen virtual presentations featuring UCI staff and UCI-supported student projects. The second annual

event showcased a broad range of research being conducted on climate change by students and faculty of all disciplines.

A trio of webinars offered guidance to local governments and environmental advocates on new statewide rules mandating the use of green infrastructure to reduce pollution and flooding caused by stormwater runoff in development projects. The webinars were organized in partnership with Clean Ocean Action, the Deal Lake Watershed Alliance, the Sierra Club, the Long Branch Green Team and the Whale Pond Brook Watershed Association.



Watch 2020 Events Online

Recordings of these and other virtual events can be found at youtube.com/UrbanCoastInstitute.

- *Panel: COVID-19 and New Jersey's Environment*
- *Stormwater Pollution and Local Watersheds*
- *Green Stormwater Infrastructure for New Jersey*
- *2020 Coastal Lakes Observing Network Workshop*

Global Ocean Governance Series

- *Antacids for the Sea: Ocean Alkalization Enhancement in Combating Climate Change*
- *Connected, Dynamic, at Risk: Coastal Nation Interests in a Strong New High Seas Biodiversity Treaty*

Marine and Environmental Speaker Series

- *The Ocean-Climate Action Plan with Jason Scorce*

▶ 2020 Snapshots



1. Monmouth University President Patrick Leahy kicks off a January press conference at the School of Science with New Jersey First Lady Tammy Murphy, Rep. Frank Pallone and statewide environmental leaders on federal climate change initiatives.

2. An October marine science class aboard the *R/V Heidi Lynn Sculthorpe*.

3. NOAA National Ocean Service Acting Assistant Administrator Nicole LeBoeuf speaks with students in School of Science Assistant Dean John Tiedemann's coastal zone management class in January.

4. Student Bre DiRenzi and UCI Field Operations Assistant Mitch Mickley survey Crosswicks Creek with an aerial drone.

5. Mickley and student Bryce McCall deploy a wave-monitoring buoy off the coast of Ocean County.

6. A Northern pufferfish expands in the hand of Assistant Professor Keith Dunton.

7. UCI Marine Scientist Jim Nickels and wife Debbie hold the Monmouth flag on the coast of Antarctica.



▶ Financial Summary: 2020 External Funding Sources

GRANTS AND FOUNDATION WORK

Achelis & Bodman Foundation: Use of environmental DNA as a tool for conservation of marine fishes and ecosystem threats in the Raritan Bay, Sandy Hook and the Lower New York Bay

Gordon and Betty Moore Foundation: Mid-Atlantic Ocean Plan implementation, including stakeholder engagement, use of Ocean Data Portal and support for ocean planning actions

Gordon and Betty Moore Foundation/University of Delaware: Intersection of Belize coral reef chemical cue research with ocean planning

Jules L. Plangere, Jr. Family Foundation: Monmouth County Coastal Lakes Observation Network (CLONet), working with communities to improve management and restoration of lakes

NJ Department of Environmental Protection: Ongoing support for multiyear zooplankton study in Barnegat Bay

NJ Department of Environmental Protection: Provide coordinating support and management of the NJ Coastal Resilience Collaborative, a network established to foster resilient coastal communities

NJ Department of Transportation: NY/NJ Harbor Contamination Assessment and Reduction Project (CARP II) sediment sampling and contaminant modeling in NY Harbor

NJ Sea Grant Consortium: Coastal Community Resilience Specialist to provide education and outreach services to coastal communities

MISCELLANEOUS AND UCI VESSEL CONTRACT WORK

Aqua Survey Inc. Hackensack River Acoustic Doppler Current Profiler (ADCP) Survey: Provided sampling support and data analysis

Great Ecology: Vessel and sampling support

Hudson River Foundation: Hudson River Park Benthic Study: Provided vessel and sampling support

NOAA Sandy Hook Laboratory Lower Passaic River White Perch Study: Vessel and fish collection

NY/NJ Baykeeper & Naval Weapons Station Earle ADCP Survey: Deployed and retrieved current meter for multi-month study

Rutgers Good Luck Point: NJDOT beneficial sediment reuse study, hydrographic survey and ADCP work

Rutgers Hendrix Creek: Hydrographic, water quality and ADCP study in Hendrix Creek (Jamaica Bay, NY)

Rutgers Navy Glider Deployment: Deployed two oceanographic gliders in New York Bight for hurricane monitoring

Scripps Institution of Oceanography CDIP Buoy Deployment: Deployed new wave buoy and retrieved old one 20 miles off Barnegat Inlet

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Your gift to Monmouth University has a direct impact on the academic experience and post-graduate success of Monmouth University students. To make a tax deductible gift to the Urban Coast Institute, please use the contribution form at the link listed below. Monetary gifts to the Urban Coast Institute support UCI Scholars student-faculty research projects and UCI operations.

www.monmouth.edu/university/give



Welcome Eric Fesselmeyer

Eric Fesselmeyer joined Monmouth University in the fall as an associate professor of economics in the Department of Economics, Finance and Real Estate. He has extensive private and government sector experience, having worked with LECG Economic Consulting, Freddie Mac, the U.S. Department of Justice, and the Singapore Housing & Development Board. He also serves as an affiliated faculty member with the UCI.

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Coastal States Stewardship Foundation, Board Member
NY/NJ Baykeeper, Board Member
National Academy of Sciences Ocean Studies Board Member
New Jersey Coastal Resilience Collaborative, Co-Chair
National Academies of Science, Engineering and Medicine National Committee for the Decade of Ocean Science for Sustainable Development

THOMAS HERRINGTON, Ph.D.

American Shore and Beach Preservation Association, Board Member
NJ Sea Grant Consortium, Board Member, Coastal Community Resilience Specialist
American Geophysical Union Thriving Earth Exchange Scientist
Jersey Shore Partnership Board of Directors
Journal of Marine Environmental Engineering Editorial Board Member
Northeast Shore & Beach Preservation Association, Vice President
N.J. Climate Change Alliance Long-Term Planning Working Group
Barnegat Bay Islands Working Group
Rutgers University Flooding Technical Advisory Panel
Rutgers University Shellfish Aquaculture Technical Advisory Committee
U.S. Army Corps of Engineers South Atlantic Coast Study, Coastal Hazards System Technical Oversight Committee

VICE ADMIRAL PAUL G. GAFFNEY II, USN (RET.)

National Academies of Sciences, Engineering and Medicine Committee on Defense Research at Historically Black Colleges and Universities and other Minority Serving Institutions
National Academies of Science, Engineering and Medicine Army Futures Command Research Program Realignment Study

JIM NICKELS

NJ Water Monitoring Council
Barnegat Bay Partnership, Science and Technical Advisory Committee
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