



COASTAL
INSTITUTE

<https://ci.uri.edu>



**"New England has a harsh climate, a barren soil, a rough and stormy coast,
and yet we love it, even with a love passing that of dwellers in more favored regions."**

—Henry Cabot Lodge

Investment in Science: the Hallmark of Coastal Research and Outreach

2019–2020

THE
UNIVERSITY
OF RHODE ISLAND



Purple Sandpiper. Photo credit: Bill Thompson.

Investment in Science: the Hallmark of Coastal Research and Outreach 2019-2020

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Investment in Science: the Hallmark of Coastal Research and Outreach

From the Director

The Coastal Institute (CI) is engaged in a broad range of activities that support its mission to increase our understanding of the relationship between human activity and the condition of the coastal environment and its resources. The CI employs this understanding to work in partnership with local, state, federal, and international agencies to contribute to the solution of the complex problems of human use and development in coastal environments. The CI works across and beyond traditional structures to encourage new approaches to problem-solving.

This report provides an overview of the major projects the CI has engaged in from May 2019 through May 2020. Given the fiscal year cycle, this period best captures an overview of the return on investment (ROI) of CI activities in support of its Senior Fellows as well as local, state, regional, and federal agencies, nongovernmental organizations, URI, and other partner academic institutions, elected officials, and municipalities.

With the NIEHS-funded Superfund Research Program (STEEP), the CI has had the opportunity to expand its international reach to the Faroe Islands, a remarkable and homogeneous culture set between the Norwegian Sea and the North Atlantic. URI also serves as host of the North Atlantic Coast (NAC) region of the national network of the Cooperative Ecosystem Studies Units (CESU). NAC-CESU's administrative home is the CI, and the CI director serves as the CESU regional director working with 10 federal partners, 35 non-federal partners, and one tribal partner as well as other regional units to provide rapid response research in service of the NAC region and beyond.

In keeping with our mission, the CI strives to serve as a neutral venue, promote collaboration, advance knowledge, and translate science. This report does not contain an exhaustive list of activities, and more information is on the CI website at ci.uri.edu. It is important to note that our reference to ROI considers not only financial returns on the overhead investment but also intangible returns that magnify URI's value to the many external partners with whom the CI engages. The intangibles speak to quality of life for humans and other species populating an ever-changing planet.

The Coastal Institute's role as a neutral venue includes collaboration with and support for the work of a wide range of partners. The CI does not reside within a single college or department at the University of Rhode Island but serves as a transdisciplinary venture that encompasses a variety of interests both in academia and beyond. Because of this structure, the CI retains a neutral stance with regard to research and the application of regulations so long as the path forward protects our oceans, coastal, and upland communities. This overarching principle informs all of the CI's activities, e.g., meeting design and attendees, outreach focus and content, and overall event structure and audience.

It is impossible to complete this report without acknowledging the impact of the Coronavirus pandemic. The late 2019 onset in Wuhan, China of the specific viral infection dubbed COVID-19, and its ultimate journey around the globe has given us all a renewed perspective of the interconnectedness of the planet we share. As I write this, the virus continues its path of destruction, but people all over the world give testament to the "we are all in this together" sentiment. Events surrounding the Black Lives Matter movement have led to fulminating protest marches around the globe as the result of yet another Black person's death at the hands of police. The BLM movement underscores the need to address the inequality of environmental justice, healthcare inequity, and climate change impacts on marginalized communities of color. We are hopeful and intentional that this awareness of one globe one people will inform our actions regarding the coastal environment and our shared environmental challenges.

—Judith Swift, Director, Coastal Institute, University of Rhode Island

Interdisciplinary and External Partner Collaborations

The Coastal Institute promotes collaboration by serving as a convener for state and regional organizations, and newly interested or previously invested parties to address problems facing our coasts and watershed. The CI serves as the host organization, convener, and co-coordinator for a variety of state and regional collaborations. By leveraging expertise, experience, and research across geographic areas and scientific disciplines, the CI works to develop cutting-edge solutions to the problems facing our coastal zone environment and communities.

North Atlantic Coast Cooperative Ecosystem Studies Unit (NAC-CESU)



Acadia National Park, Maine. Photo credit: Seth Lerman, National Park Service.

URI's role as host to the NAC-CESU is situated within the CI, and the CI director also serves as director of the NAC-CESU. The US Department of the Interior manages this regional initiative to move resources rapidly from federal agencies to targeted researchers via statements of interest, a funding capacity of particular value when the conducting of research is critical within a tight timeframe, e.g., assessing damage to national parks post-Superstorm Sandy.

- Provides research funding for URI students and faculty and provides a base of operations for 5 Full Time Equivalents from the National Park Service who are duty-stationed at URI.
- NAC-CESU website has been redesigned to include current technology in support of the region, including a project database that serves as an electronic data collection tool for all projects. NAC-CESU will share these data and this technology with the 17 regional units. http://www.cesu.psu.edu/unit_portals/NOAT_portal.htm
- Federal Partners (10):** Bureau of Indian Affairs, US Army Corps of Engineers - Civil Works, Bureau of Ocean Energy Management, Department of Defense, US Fish and Wildlife Service, National Oceanic and Atmospheric Administration, National Park Service, US Department of Agriculture - National Resources Conservation Service, US Geological Survey.

—**Tribal Partner (1):** Narragansett Indian Tribe.

—**Academic Partners (23):** Bates College, Brown University, Bryn Mawr College, City University of New York, College of the Atlantic, Columbia University, Cornell University, Harvard University, Mansfield University, Northeastern University, Rutgers University, Stockton University, Stony Brook University, SUNY-College of Environmental Science and Forestry, University of Connecticut, University of Maine - Orono, University of Maryland Center for Environmental Science, University of Maryland - Eastern Shore, University of Massachusetts - Amherst, University of Massachusetts - Boston, University of New England, University of Rhode Island, Yale University.

—**Other Partners (12):** American Turtle Observatory, Biodiversity Research Institute, Marine Biological Laboratory, Maryland Coastal Bays Program, Natural Areas Association, New Jersey Audubon, Provincetown Center for Coastal Studies, Schoodic Institute at Acadia National Park, Stevens Institute of Technology, Vermont Center for Ecostudies, Virginia Aquarium & Marine Science Center Foundation, Inc., Woods Hole Oceanographic Institution.

- **CI Support:** \$10,000 average per year.

- **CI Partners (oversight):** National Park Service, Department of the Interior.

- **ROI:** \$897,000 average per year in CESU grants to URI; incoming federal support \$15,000 per year to URI/CI as the host institution.

National Park Service Duty-Stationed Personnel at URI



Alexa Armstrong (left, NPS Biological Technician) and Kristen Thiebault (right, NPS-GSA, GIP Intern) sampling a nekton throw trap at Assateague Island NS (2016). Photo credit: National Park Service.

A new National Park Service Coastal Ecologist was appointed in June of last year. She joined the five other NPS personnel duty-stationed at URI. NPS programs include the North Atlantic Coast Cooperative Ecosystem Studies Unit, the Northeast Coastal and Barrier Network Inventory and Monitoring Division, the Climate Change Response Program, and the Field Technical Support Center. These programs provide support to the University in the form of grants, internships, field experience, classes, career counseling, and service on graduate committees.

- **CI Support:** \$2,500 average annual support.

- **CI Partners:** National Park Service.

- **ROI:** *Partnership for the Environment: National Park Service contributions to the University of Rhode Island, 2020 Summary:* <https://ci.uri.edu/partnership-for-the-environment-national-park-service-contributions-to-the-university-of-rhode-island-2020-summary/>



Where Rivers
Meet the Sea.
*Photo credit: Ayla
Fox for the
Narragansett Bay
Estuary Program.*

This past January of 2020, the CI director concluded nine years as chair of the Narragansett Bay Estuary Program Steering Committee, Executive Committee, and Communications/Media Committee. The CI director also worked

in partnership with NBEP's host entity, the New England Interstate Water Pollution Control Commission (NEIWPCC) to define governance policy, oversee strategic planning, grant management, and integration within the National Estuary Program (NEP) under the Environmental Protection Agency (EPA). The CI assistant director now serves on the Steering Committee. The role of the Steering Committee is to provide guidance on bi-state work to protect and preserve Narragansett Bay and its watershed through partnerships that conserve and restore natural resources, enhance water quality, and promote community engagement.

- As NBEP chair, CI director has overseen the completion of the EPA-approved Corrective Action Plan, which was initiated and promoted by the CI director as essential to the improvement of the efficacy and value of the NBEP in keeping with National Estuary Program guidelines.
- As NBEP chair, CI director worked with NEIWPCC and both regional and national offices of the Environmental Protection Agency to complete a multi-stage program evaluation of the NBEP as required of all NEPs. The final report reflected excellent progress and a strongly optimistic future and led to the authorization of five additional years of the program.
- NBEP continued to promote the EPA-required Status and Trends Report, "The State of Narragansett Bay and Its Watershed," with public workshops in the Taunton River Watershed and one in the Blackstone River Watershed held on April 29, 2019.
- CI director served on the three following search committees for a new NBEP program director (a series of unanticipated events on the part of selected candidates led to the need to reopen the search twice). The newly appointed director began in January 2019 and is proving to be a highly successful appointment.

● **CI Support:** director, seven days monthly, assistant director, one day monthly, associate scientist Roman, three weeks of Science Advisory Committee.

● **CI Partners:** US Environmental Protection Agency (funding and oversight of the National Estuary Program), New England Interstate Water Pollution Control Commission (host entity), Narragansett Bay Estuary Program Executive and Steering Committees comprised of 24 bi-state representatives from state agencies, universities, and nongovernmental organizations in Rhode Island and Massachusetts.

● **ROI:** CI mission is to partner with state, regional, and federal agencies to monitor and manage estuaries and watersheds for ecological health and compliance with state and federal guidelines. Based on the findings of the program evaluation, NBEP is well-positioned to deliver its obligations driven by the Clean Water Act. In addition, URI has benefited from interdisciplinary relationships created through the Science Advisory Committee and leading to Southeast New England Program (SNEP) grant funding.



Michael Sullivan of Shell Oil Products US presents at SSEER annual meeting.

The CI maintains a Memorandum of Understanding (MOU) with the RI Department of Environmental Management (RIDEM), Office of Emergency Response, to improve environmental emergency preparedness and response in Rhode Island by partnering with RIDEM to deploy university research scientists, professional staff, and graduate students to assess, reduce, or remediate threats to public health and safety and the environment in a natural or humanmade disaster.

- CI works with RIDEM’s Office of Emergency Management to hold annual training for SSEER personnel.
- Summer 2019 continuation of the annual workshop for SSEER scientists and students trained to be deployed in a natural or humanmade disaster. Workshop goals are to refresh awareness and skills, review Incident Command System (ICS) and deployment protocol, recruit and train new members. During the period of this report, the annual workshop focused on the National Incident Management System (NIMS) and ICS with a presentation from LT. Clifton Graham, US Coast Guard. In addition, Michael Sullivan of Shell Oil Products US provided an overview of the management of the Shell Motiva Providence Terminal in the Port of Providence and Steve Lehmann, senior scientific support coordinator, NOAA’s Office of Response and Restoration (OR&R), spoke regarding SSEER’s recognized value as a national model. Lehmann provided a detailed overview of the SCAT (Shoreline Cleanup and Assessment Technique) protocol. P. August, J. Ball, and G. Bonyngge presented “The Anatomy of a Major Drill: The Shell PVD Exercise” at the SSEER Annual Workshop and N. Vinhateiro presented “Data Management for Risk Assessment and Recovery.”

—Participation in disaster response training events:

-P. August attended the “Leveraging Science and Academic Engagement During Incidents” workshop on June 24-26, 2019, at The Bay Conference Center in Tiburon, CA. SSEER was presented as a national model for engaging academic resources in emergency response.

-A planned exercise at the Shell Terminal for Summer 2020 had to be postponed due to COVID-19.

-SSEER personnel received detailed training in the SCAT process at the 2019 annual meeting. A field component was planned but had to be canceled due to inclement weather.

● **CI Support:** CI director or her designee oversight with Jim Ball, director RIDEM/OEM; digital media/systems management specialist staff time; and \$17,307 Dr. August, Professor Emeritus, is provided 1.5 months to “deepen the bench” during hurricane season, nor’easter season, and other possible emergencies. The August support also includes and ensures oversight of SSEER commitments in the director’s absence. Added to the partial support roster this year was Greg Bonyngge, a specialist in GIS and drone technology (1.2 months at \$13,198 salary and Environmental Data Center service fee).

● **CI Partners:** RI Department of Environmental Management, Office of Emergency Management, US Coast Guard, CELS, GSO, specialists in complementary areas from state and private colleges and universities, NOAA, OR&R.

● **ROI:** Meets CI’s mission in service of the State of Rhode Island; funding provided by RIDEM or next tier ICS lead agency in a qualifying emergency event.

Support of Conferences and Summits

CI sponsors scientific and management conferences that highlight the ecology, resilience, or management of Narragansett Bay and its coast and watershed. The conferences, in turn, are a showcase for URI scientists and students as well as essential opportunities for partnership building, sharing of research, and dissemination of solutions.

“Over the years, the CI GIA support has been an effective lever to innovate, explore, and discover so essential to cutting edge scientific research. In addition, the funds are key to enabling travel support for graduate students and post-docs to conferences, a much needed but typically underfunded aspect of career building for our mentees. I know of no alternative funding support that is as effective in promoting innovative research.”

—Dr. Susanne Menden-Deuer, Professor of Oceanography, URI

Land and Water Conservation Summit



Keynote speaker Dr. Mamie Parker, former head of Fisheries and Northeast Director at the US Fish & Wildlife Service (center) with conference attendees.

CI is a lead sponsor of this annual, daylong conference that provides information, skills, and connections to conservation NGOs, watershed councils, town managers, regulators, and individuals interested in land, watershed, riverine systems, fresh and saltwater, and estuary conservation. In addition, the CI director assists with conference planning and serves as emcee. CI prepares posters, display table, and all participate in the daylong summit.

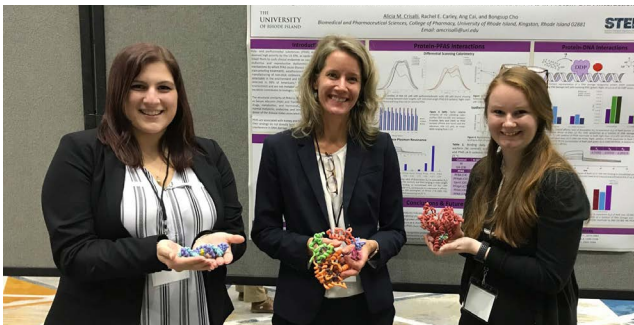
—Sponsored, attended, planned, and emceed the 2020 Summit held March 7, 2020; 330 registered; 42 no shows likely due to COVID-19 attendees.

—Sponsored, attended, planned, and emceed for the 2019 Summit held March 9, 2019; ~370 attendees.

—Organized 2019 workshop “Update on ubiquitous contaminant- PFAS.” CI presented as the research translation core of the STEEP Superfund Research Program.

- **CI Support:** \$1,000 annually, two student registrations.
- **CI Partners:** Rhode Island Audubon, Rhode Island Land Trust Council, STEEP Superfund Research Program, RI Department of Health, RI Department of Environmental Management.
- **ROI:** Meets the CI mission to advance knowledge and develop solutions to environmental problems in coastal ecosystems. Summit attendees have included elected officials from Rhode Island and New England, e.g., mayors, town managers, Governor Raimondo, and Senator Jack Reed (D-RI), as well as federal agency representatives.

32nd Annual NIEHS Superfund Research Program Meeting



STEPP trainees with NIEHS Program Officer Michelle Heacock at NIEHS SRP Annual Conference.

NIEHS hosted its annual workshop for Superfund Research Programs (SRPs) across the country on November 18-20, 2019, in Seattle, WA, with a theme of Data to Knowledge to Action. The CI participated in this meeting as part of the Research Translation Core (RTC) for the STEEP SRP – an \$8 million award to URI from the NIEHS.

—CI assistant director and digital media/systems management specialist attended the SRP meeting with other representatives of the URI STEEP Center.

—CI personnel prepared and presented a poster describing STEEP’s private well water testing program, new reporting tools to distribute study results, and the development of tailored media to educate impacted communities on the human health implications of PFAS contamination.

—CI participated in SRP in 3-D – a special session at the conference featuring products developed by the Research Translation and Community Engagement Cores of select SRPs.

● **CI Support:** Staff time: assistant director and digital media/systems management specialist.

● **CI Partners:** Harvard T. H. Chan School of Public Health, Silent Spring Institute.

● **ROI:** The conference highlighted URI’s leadership in PFAS research and the CI’s strength in translating this research into actionable information for regulators and communities, adding value to the broader NIEHS SRP network.

Support of Lecture Series

CI supports several lecture series at URI to promote the dissemination of scientific information, promote inter- and intra-institution collaborations, and support graduate student education.

Scott W. Nixon Lecture

The 8th Annual Scott W. Nixon Lecture

'A PERFECT STORM' OF PLASTIC: SCIENCE & STORIES FROM THE FRONT LINES

Thursday, March 26th
3:30–5:00 P.M.
Coastal Institute Auditorium
Narragansett Bay Campus

POSTPONED

Photo: Brocken Inaglory

Jenna Jambeck, PhD
Professor
College of Engineering
University of Georgia

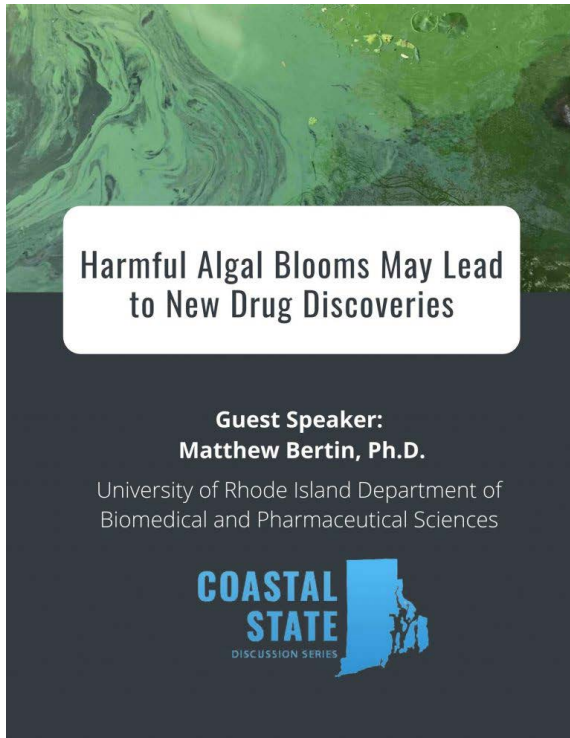
Invited speaker Dr. Jenna Jambeck rescheduled to 2021 due to COVID-19.

CI hosts an annual lecture in memory of Dr. Scott W. Nixon, a world-renowned biological oceanographer who spent his career at the URI Graduate School of Oceanography. Guest lecturers from around the world deliver a keynote lecture and attend a series of daytime and evening events available to URI researchers and graduate students as well as the general public (<https://ci.uri.edu/intitatives/ongoing-initiatives/nixon-lecture/>)

—In 2020, CI invited Dr. Jenna Jambeck, a Professor in Environmental Engineering at the University of Georgia. She has been conducting research on solid waste issues for over 23 years, with related projects on marine debris for 19. Dr. Jambeck also specializes in global waste management issues and plastic contamination, and she was invited in support of Vice President Peter Snyder’s “Plastics: Land to Sea” initiative. This lecture was postponed due to COVID-19 and will be rescheduled in lieu of a make-do virtual presentation because complementary workshops and meetings surround the lecture.

- **CI Support:** \$8,000 average annually (\$0 in 2020).
- **CI Partners:** GSO and EPA-AED serve as members of the selection committee.
- **ROI:** Attendance of 100 in-person and ~80 virtual attendees. Distribution of excellent science through lecture attendance and discussion, exposure of URI community and beyond to scholar's expertise, and continued use of lecture through streaming events and archiving on CI's YouTube Channel: www.youtube.com/user/CoastURI

Coastal State Series



Flyer for April 2020 Coastal Lecture on harmful algal blooms organized by Rhode Island Sea Grant.

CI supports this annual series of four lectures focused on the state and future of coastal Rhode Island: <http://seagrant.gso.uri.edu/special-programs/coastal-state-discussion-series/>

The series was offered in-person in Spring 2019 and was continued as a virtual offering in Spring 2020 due to COVID-19.

- **CI Support:** \$350 average annual for livecasting that attracts larger audiences of undergraduates, graduate students, faculty and the interested public.
- **CI Partners:** Rhode Island Sea Grant (sponsor), URI Graduate School of Oceanography.
- **ROI:** Meets CI mission of dissemination of science to enrich undergraduate and graduate education with new insights.

Research Initiative Support and Engagement

The CI engages in research in three broad categories: 1) development of interdisciplinary proposals to directly fund CI initiatives in partnership with others, e.g., demonstration sites; 2) catalyst grants to provide early support to principal investigators, e.g., additional data, external proposal review, graduate student support; 3) leveraging grants to bridge funding gaps not supported by a grant but crucial to the overall project's success, e.g., conference attendance, publication costs, equipment critical to completion. The CI is primarily concerned with helping PIs to succeed, which can range from direct involvement in a grant-funded project (STEEP SRP) to CI staff support of an ongoing initiative (Coastal Monitoring). The CI is also committed to supporting long-term databases (Watershed Watch). The CI consistently works with Sr Fellows to support their research needs as possible within the budget. Research projects are selected and supported to ensure a return on investment (ROI) that seeds additional projects.

"A range of research activities would not have been possible without Coastal Institute support. Grant-in-Aid funding supported my attendance and presentation of results from our recent Arctic food web studies at the Gordon Research Conference on Polar Marine Science in Lucca, Italy, in 2019. GIA funds also enabled us to purchase a more powerful computer, equipment, and supplies to allow a new postdoctoral researcher to conduct genetic sequence analysis on Arctic zooplankton populations with greater speed and efficiency."

—Dr. Robert Campbell, Associate Marine Scientist, URI

Fulweiler Award: Research on Nitrogen Uptake Cycle in Narragansett Bay



Coring at Providence River. Photo credit: Fulweiler Lab, Boston University.

CI joined with Rhode Island Sea Grant to alternately fund three of six years of annual research focused on the Narragansett Bay Nitrogen Uptake Cycle research of Dr. Robinson “Wally” Fulweiler, which relies heavily on data collected by SW. Nixon et al. since 1974. Fulweiler is employing nitrogen flux measures as she tries to tease out nitrogen reduction vs. temperature increase responses. This research— “Narragansett Bay Benthic Fluxes: A Barometer of Change”—is critical to a deeper understanding of climate change impacts on Narragansett Bay. FY 21 is the last year of this support, and Dr. Fulweiler will provide a public presentation on her findings during 2021.

- **CI Support:** \$18,000 over three years.
- **CI Partners:** RISG, Fulweiler Lab at Boston University.
- **ROI:** Much needed understanding of the nitrogen cycle in Narragansett Bay, which has significant economic impacts on fisheries, tourism, and water quality, among other issues of habitat and ecological health.

National Institute of Environmental Health Sciences Superfund Research Program



STEEP Trainee Marisa Pfohl presents poster at conference.

<p>HOW AM I EXPOSED TO PFAS?</p> <p>98% of Americans have PFAS – manufactured chemicals common in water-resistant and nonstick products – in their blood. One source of exposure can be drinking water. The U.S. EPA has issued a health advisory for two of the most common PFAS chemicals – PFOA and PFAS – by suggesting a limit of 70 parts per trillion. As a private well owner, you can take steps to protect your family’s health. Determine if there is known contamination to the water in your area and at what level. If so, explore available treatment options.</p>	<p>ARE THERE PFASs IN MY WELL WATER?</p> <p>As a homeowner or renter, you are rarely required to test your well water and likely have never tested for PFAS. If you live near PFAS-producing industrial plants, military bases, firefighting training areas, or municipal airports that use PFAS-containing firefighting foam, testing is warranted. Contact your local, county, or state health officials. Seek guidance on which labs are certified to test for PFAS. Ask what the cost might be and if funding assistance is available.*</p>	<p>WHAT IF THERE ARE PFASs IN MY WELL WATER?</p> <p>If your water exceeds a state or federal guideline, the short-term solution is to check with your state Department of Health for recommended brands of bottled water. Boiling does not remove PFAS and can instead concentrate the chemicals. The long-term solution is a home water treatment system. The most common PFAS chemicals, PFOS and PFOA, can be removed by either activated carbon filters or reverse osmosis systems. NSF International (www.nsf.org) certifies treatment systems for PFOS and PFOA removal under protocol F473. Remember: your treatment system will only be as effective as your regular maintenance.</p>	<p>SHOULD I TREAT MORE THAN DRINKING WATER?</p> <p>If your well has PFAS contamination, you can treat all the water coming into your home, or just treat water used for drinking and cooking, which are the largest sources of exposure. For example, there’s less exposure from eating backyard garden produce grown with PFAS-contaminated water and low to no exposure from showering, laundering, and dishwashing. Consider the potential impacts of PFAS exposure as you choose the best well water treatment option for your family’s protection.</p>
<p>PLAY IT SAFE. LEARN MORE ABOUT EXPOSURE AND PROTECTION AT URLEDU/STEEP.</p> <p>*Cape Cod resident well water testing information: un.edu/steep/wellwater</p>			
National Institute of Environmental Health Sciences Superfund Research Program	THE UNIVERSITY OF RHODE ISLAND	HARVARD T.H. CHAN SCHOOL OF PUBLIC HEALTH Department of Environmental Health	SILENT SPRING INSTITUTE Environmental Health Solutions

STEEP tip card for private well owners, product of RTC.

CI serves as lead of the Research Translation Core (CI-RTC) of STEEP (Sources, Transport, Exposure, Effects of PFASs) Superfund Research Program (SRP). This interdisciplinary and multi-institutional grant draws on the expertise of several URI colleges and units, including GSO, CELS (URI Cooperative Extension), College of Engineering (COE), Pharmacy, University Libraries, and the CI; Harvard T.H. Chan School of Public Health, Department of Environmental Health; and Silent Spring Institute to conduct research on emerging contaminants (PFASs) that a) impact environmental and human health and b) engage the general public in the findings and potential prevention or lessening of adverse health impacts.

—CI-RTC collaborates with key state and interstate agencies (e.g., health and environment) as well as a range of federal agencies, including EPA and ATSDR.

—CI-RTC continues to provide information to the New England Interstate Water Pollution Control Commission's executive committee and board of commissioners, which links STEEP to regulatory agencies throughout New England.

—CI-RTC represented the SRP at the Annual NIEHS Superfund Research Program Meeting and presented STEEP's private well water testing program, new reporting tools to distribute study results, and development of tailored media to educate impacted communities on the human health implications of PFAS contamination.

—CI-RTC continues to maintain the STEEP website (www.uri.edu/steep) as well as social media platforms (Twitter, Instagram, Facebook, YouTube, LinkedIn) that drive younger generations to the site and engage professional audiences. RTC consistently works with researchers to ensure scientific accuracy of media posts and closely follows media to capture information of-the-moment.

—CI-RTC continues to develop a robust library of resource and promotional materials focusing on STEEP research and PFAS consumer information. In 2019, RTC began a sequence of one-pagers targeted for distinct and diverse audiences (e.g., exposed populations that may benefit from medical monitoring).

—CI-RTC again produced a 40-page booklet to elucidate STEEP's progress for the program's External Advisory Committee and university administrators.

—CI-RTC produced a series of 8 short videos—SILENT CHEMICALS, LOUD SCIENCE—where STEEP researchers discuss how PFAS chemicals are used, their fate and transport in the environment, and their impacts to ecosystem and human health.

—CI-RTC assists STEEP trainees (graduate students and post-docs from URI and Harvard) in presentation skills, poster design, crafting social media, event planning, writing for the public, and developing an overall professional persona.

—CI-RTC hosted a STEEP-related public lecture by Arlene Blum, the executive director of the Green Science Policy Institute. Blum's talk was titled "Mountains and Molecules" and focused on mountaineering and the metaphorical mountains combating hazardous chemicals.

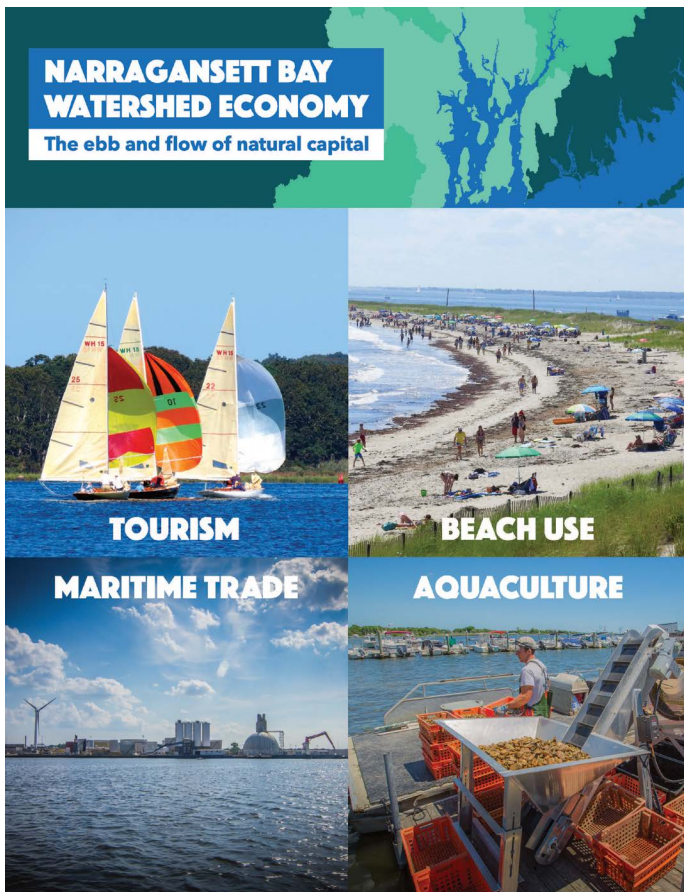
—CI-RTC provided materials to the Conservation Law Foundation for their Providence screening of Dark Waters, the story of Rob Billot, an environmental lawyer's federal suit against DuPont, a PFAS manufacturer, for health impacts in a West Virginia community.

—CI-RTC prepared educational and promotional materials for the Community Engagement Core-supported Science Day for the Cape Cod Barnstable County study site. RTC also attended this event to support and assist CEC.

● **CI Support:** \$24,2204 (19,204 in Grants-in-Aid and \$5,000 in additional CI support). Staff time: director, two weeks annually.

● **CI Partners:** GSO, CELS, COE, Pharmacy, Harvard T. H. Chan School of Public Health, Department of Environmental Health, and Silent Spring Institute.

● **ROI:** 5-years overhead return; a modest percentage of staff salary; prominent use of research translation in one-pagers, brochures, booklets, flyers, PowerPoint, web, and poster design; presentations at events and workshops; coaching for Training Core; and social media skills—all designed to address a serious threat to public health and damage to the global environment.



“We were aiming for something that we could deliver to the policymakers, to state agencies, the governor, nonprofits, scientists working on the Narragansett Bay Watershed, and also development planners so communities understand what their watershed is actually delivering.”

—Dr. Emi Uchida

Under the leadership of project associate director, Dr. Emi Uchida, the CI and its partners have developed a comprehensive economic report for the Narragansett Bay Watershed (NBW) that assigns value to the bay, salt marshes, beaches, watersheds, riverine systems, conserved lands, and the coastal zone in general as well as marine trades, tourism, aesthetic impacts on multiplier effect, ecosystem services, etc. The goal of this report is to quantify the benefits we derive from NBW’s natural capital, so, in turn, we can inform and improve decision-making policy regarding the management and protection of the watershed’s environment. Decisions we make in the NBW every day—e.g., land use and management, wastewater management, subsidies for economic development—can have direct and indirect impacts on the watershed, its natural capital, and the economy and quality of life that it supports.

Products include:

—A dashboard-style website that serves as the accessible outlet for these products:

<https://www.nbweconomy.org>

—A series of economic sector reports by Dr. Emi Uchida et al. itemizing the value of myriad activities related to the bay and its watershed, e.g., tourism, fisheries, water quality, etc. These reports are available at

<https://www.nbweconomy.org/economic-sectors/>

—A series of valuation studies including; point and non-point source pollution, value of water quality in the housing market, and value of the coast. The studies can be found at

<https://www.nbweconomy.org/value-studies/>

—An Economic History of Narragansett Bay and Its Watershed by Professor Emeritus Dr. Maury Klein, a highly regarded American business historian. The first draft is complete, and we have begun layout and accruing appropriate photos. CI is seeking sufficient printing funds to allow free copies to the interested general public.

● **CI Support:** \$98,000 to date (grad student support, housing database, faculty summer salary, author of economic history, and staff time director, social media/systems management).

● **CI Partners:** Mass Audubon, URI CRC, GSO, Economic and Natural Resource Economics, Stanford University, The Natural Capital Project, Providence Journal, RI Historical Society, CI staff and students.

● **ROI:** The Governor and the General Assembly are now in the position to make policy, development, and investment decisions based on the firm knowledge that the 13 key sectors covered in this report cumulatively yield \$14 billion in revenue and expenditure as well as 97,000 full and part-time jobs.

Climate Change Response Demonstration Sites

CI began an ongoing initiative to establish three demonstration sites throughout the state to test and demonstrate how coastal resiliency to climate change can be improved.



COASTAL INSTITUTE CLIMATE RESPONSE DEMONSTRATION SITES



Demonstration Site: Natural Area, Napatree Point

led by Dr. Peter August



Dr. Pete August and Dr. Candace Oviatt conducting research at Napatree Point.

CI established its first demonstration site at the Napatree Point Conservation Area in Westerly, RI. Napatree Point was once the site of 39 summer “cottages” that were destroyed in the 1938 Hurricane. Following that natural disaster, a conservation area was established, and construction not allowed. This site demonstrates how natural areas can heal and adapt to impacts of climate change. <https://ci.uri.edu/intitatives/ongoing-initiatives/demonstration/>

Supported removal of invasives and planting of Rhode Island native plants, grasses, and trees in an effort to reduce and close walking paths that cut through the vegetation outside of designated trails.

—CI produced and scripted a trilogy of videos highlighting the ecological importance of Napatree Point and the research that is conducted there: *Change: Tracking the Shifting Shore-*

line; Connected: Wildlife of the Barrier Beach; and Discovery: People in Nature at Napatree continue to be viewed the CI YouTube Channel: www.youtube.com/user/CoastURI

—Animation of shoreline change from 1939 to 2014 developed by the Coastal Institute was prominently featured in a virtual exhibition of the history of coastal forts of Eastern Long Island Sound sponsored by Henry L. Ferguson Museum on Fishers Island (see Fort Mansfield tab at <https://fergusonmuseum.org/2020/05/annual-exhibition-2020-the-coastal-forts-of-eastern-long-island-sound/>)

—Monitoring abiotic and biotic factors in the Napatree Lagoon to better understand the interactions among important species such as horseshoe crabs and piping plovers, among others. Results can be found in the 2019 State of Napatree Report: <https://thewatchhillconservancy.org/napatree/napatree-resources/>

—Installed 1,250 feet of split-rail fencing to guide visitors away from plant restoration sites yet allowing the natural movement of sand, an integral element in dune dynamics.

—Partnered in monitoring of eelgrass beds off Napatree in Little Narragansett Bay, site of the largest contiguous patch of seagrass in RI.

—Participated in opposition of a 10-acre private kelp farm less than 1,000 feet off the shore of Napatree Beach. A farm at this location would negatively impact commercial and recreational fishing activities, create nuisance debris on the shore of Napatree, degrade the quality of habitat in RI's highest quality sea duck winter grounds, and create an aesthetic affront to an iconic section of near-shore waters that is registered in the National Register of Historic Places.

—Participated in the development of a plan to mitigate flooding from nuisance tides at the entrance of the Napatree Point Conservation Area. The result of this work is a \$280,000 proposal pending review with the RI DEM Resilience grant program.

—During spring semester 2020, contributed to the mentoring of 42 senior college students from URI and Eastern Connecticut State University who, as part of a capstone project, developed mitigation plans to reduce the impact of the anticipated 3' sea level rise scenario by 2050.

—Assisted in the preparation of the 2019 State of Napatree Report. A number of Coastal Institute sponsored projects are reported there (bat surveys, meso-mammal surveys, drone imaging, eelgrass mapping, etc.)

—Presented plenary lecture on the Napatree Demonstration site at the annual science conference for the RI Natural History Survey.

—Presented a kickoff (virtual) presentation in The Watch Hill Conservancy Lanphear LIVE! lecture series on stewardship of Napatree Point under the CI Demonstration Site model (<https://youtu.be/CyCq7lY792I>)

● **CI Support:** assistant director conducted monitoring studies of lagoon onsite and served as ecology science advisor; provided match to hire student assistant for the Enhancing Ecosystem Resilience at Napatree Point Grant submitted to Coastal Resources Management Council.

● **CI Partners:** The Watch Hill Conservancy, Watch Hill Fire District, RI Natural History Survey–Rhody Native Program, RI Coastal Resources Management Council, RI Department of Environmental Management, RI Sea Grant, Eastern Connecticut State University.

● **ROI:** Developing best practices for coastal resilience by observing and collecting data on “natural area” left to recover on its own with little to no human interference; support of student engagement.

Demonstration Site: Urban Watershed, Port of Providence and Roger Williams Park

led by Dr. Austin Becker and Dr. Art Gold



View of the Port of Providence from the water.

Focused on coastal resiliency of an urban hub as well as the vulnerability of the Port of Providence—a port critical to all New England—to demonstrate ways in which business and industry that depend on being located on the water are vulnerable and to develop practices to mitigate the impacts of climate change and increase resilience.

—Long-range study complete and storm scenario website established:

<https://www.portofprovidenceresilience.org/>

—Dr. Becker is seeking funds to support further work on port resilience.

—Restoration of Roger Williams Park water features. The project serves as a demonstration of techniques for green infrastructure to address the challenge of stormwater pollution that plagues freshwater and estuaries in RI and southern New England. The project is focused on restoring the “aquascapes” of Roger Williams Park (RWP), which is a major cultural, recreational, and environmental resource for all of RI with particular value for the local residents, many of whom live in underserved communities. The waters of RWP flow into the Pawtuxet River and into the Narragansett Bay, so water quality improvements will ripple well beyond the project site.

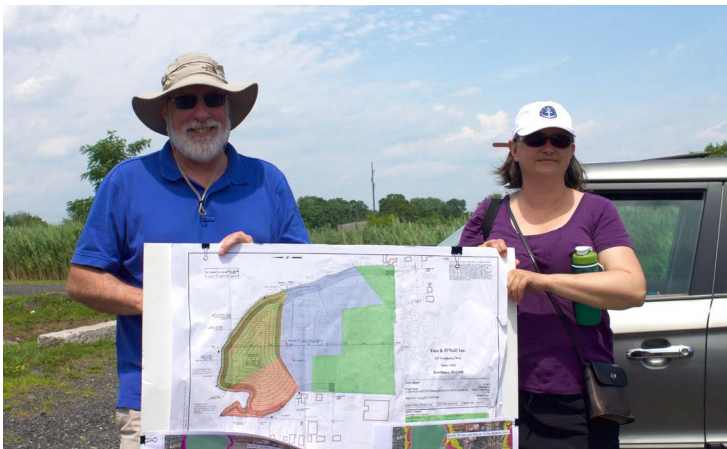
- **CI Support:** \$8,666 for high-frequency water quality monitoring at Roger Williams Park for this reporting period.

- **CI Partners:** Marine Affairs, CRMC, Department of Landscape Architecture. The Nature Conservancy, Audubon.

- **ROI:** development of best practices to protect port infrastructure and prevent loss of services and potential release of contaminants. Assist Roger Williams Park in becoming an innovative center for stormwater with the longer goal of cleaning the waters of that park.

Demonstration Site: Mixed-Use, towns of Warren, RI and Barrington, RI

co-led by associate scientist Dr. Charles Roman, CI digital media/systems specialist Amber Neville, and Teresa Crean, Community Planning and Coastal Resilience, Extension Specialist



Mixed-Use team members participating in a site visit to Warren, RI.

There are parallel threats from climate change to the neighboring towns of Warren and Barrington, yet distinct challenges due to their array of economic uses and concerns. CI supports a mixed-use site to demonstrate how coastal communities with a variety of residential, business, municipal, and commercial interests can work together to improve resiliency. A summary report of activities can be found here: <https://ci.uri.edu/preparing-for-resilience-barrington-and-warren-mixed-use-climate-response-demonstration-site-fall-2019/>

—Held topic-specific workshops to address issues such as land use and transportation networks.

—Facilitated work sessions with state and municipal planners to discuss the process for the buyout process of coastal properties threatened by sea-level rise.

—Hosted University of Pennsylvania graduate student for follow-on work after design studio and week-long study tour focused on coastal resilience of Barrington and Warren.

—Presented at Town of Barrington’s Emergency Preparedness Week.

—Participated in Community Resilience Building workshops.

—Participated in Barrington’s Program for Public Information Committee.

- **CI Support:** Staff time for associate scientist, digital media/systems specialist, and coastal community planner.

- **CI Partners:** Town of Warren, Town of Barrington, URI Coastal Resources Center, Save the Bay, RI Coastal Resources Management Council, The Nature Conservancy, University of Pennsylvania, CELS, GSO.

- **ROI:** In keeping with the CI mission to develop and test best practices for coastal management.

CI Senior Fellows

CI fosters and facilitates interaction with Senior Fellows who constitute the collective expertise that can be brought to bear in resolving environmental problems in coastal ecosystems. Senior Fellows include professionals from a wide array of disciplines with affiliations at URI, Brown, RIDEM, Harvard, National Park Service, Roger Williams University, Narragansett Bay Estuary Program, NGOs, and freelance entrepreneurial studios. Senior Fellows serve as consultants to the director on CI projects and investments, provide expertise in the sciences, social sciences, humanities, law, and the arts for outreach products. CI Senior Fellows are a major strength in the development of interdisciplinary research that supports the mission of the CI. In turn, the CI sponsors workshops and professional development opportunities to support and produce high-quality and competitive research.



CI Annual field trip to Narrow River Watershed 2019.

—Senior Fellows list: <https://ci.uri.edu/fellows/current-senior-fellows/>

—Awarded Grants-In-Aid to URI CI Senior Fellows totaling \$181,503 (FY2020) in College of Arts and Sciences, College of the Environment and Life Sciences (Departments: Biological Sciences, College of Pharmacy, College of Engineering, Environmental and Natural Resource Economics, Natural Resources Science, Landscape Architecture, Cell and Molecular Biology; Environmental Data Center), Graduate School of Oceanography (Coastal Resources Center, Inner Space Center, Office of Marine Programs, RI Sea Grant.)

—Examples include proposal development, research publication, critical equipment purchase and/or repair, hiring undergraduate and graduate students for coastal projects/research; purchasing display equipment, field gear, drones, and cameras; and support of websites, whitepapers, conferences, and professional development for large grant management.

—July 2019 annual meeting included a field trip to the Narrow River Watershed to learn about salt marsh restoration efforts and provided a yearly update on CI initiatives, funding, and future plans.

● **CI Support:** \$3,500 annual average (GIA support in the body of text), CI staff, and students.

● **CI Partners:** vary each year with field trip site, e.g., Save the Bay, NPS, agricultural sites, experimental contaminant removal sites, and other environmental partners from the RI's South Shore Coastal Ponds to the Upper Watershed.

● **ROI:** CI Senior Fellow field trips are a vivid exercise in disciplinary cross-pollination. Several CI proposals have grown out of these daylong discussions that encourage scientists to meet colleagues from other departments, colleges, and institutions.

“The Senior Fellow is the heart and soul of the Coastal Institute”

—Peter August

Welcome New Senior Fellows



*Reza Hashemi
Department of Ocean
Engineering, URI*



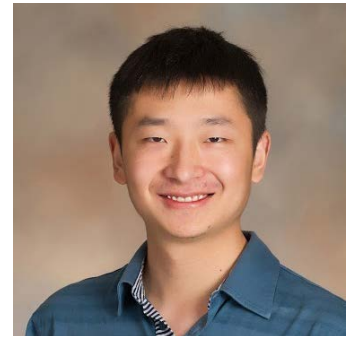
*Brandon Fuller
Communications & Marketing,
URI*



*Jason Parent
Department of Natural
Resources, URI*



*Brian Gerber
Department of Natural
Resources, URI*



*Liu Pengfei
Environmental and National
Resource Economics, URI*



*Lori Jeremiah, Artist/Teacher
Photo credit: Michael Derr,
The Independent*



*David Ciochetto
RI Coastal Resources
Management Council
Photo credit: RI Coastal
Resources Management Council*



*Cathy Johnson
Northeast Region Coastal
Ecology, National Park Service*



*Veronique Oldham
Graduate School of
Oceanography, URI*



*Melva Treviño-Peña
Department of Marine
Affairs, URI*

Outreach, Training, and Knowledge for the Public Good

The CI partners with a wide range of state and federal agencies, nonprofits, academic institutions, small businesses, and individuals. The CI provides or supports training to engage citizen scientists in comprehensive stewardship of Narragansett Bay and its watershed, the coastal ponds, saltmarshes and its multispecies inhabitants. The CI also develops reports and other outreach materials designed for the public as a means to enrich their understanding as well as to enhance their connection to RI's 400 miles of coastline — a heritage of significant value and in need of oversight as climate change challenges our allegiance to science in the present and future.

Data Carpentry / rhodyRstats



The CI continues to encourage and support annual Data Carpentry Bootcamps and rhodyRstats workshops to increase data science literacy across disciplines and promote academic growth and facility in the management and manipulation of big data.

—Supported “Data Carpentry for Social Sciences” workshop on January 15, 2020.

—Supported RhodyRStats Workshop August 29-30, 2019.

● **CI Support:** \$5,000 average annually, CI specialist staff time.

● **CI Partners:** EPA-AED, Data Carpentry Bootcamps, URI CELS, BioSci & Library Science.

● **ROI:** There are a growing number of schools with data science-focused programs. Three examples are BIDS at UC-Berkeley (<https://bids.berkeley.edu/>), eScience at UW (<http://escience.washington.edu/>), and Data Science Institute at Columbia (<http://datascience.columbia.edu/>). The CI's investments in boot camps and workshops are worthwhile as we watch social scientists, scientists, humanists, and artists gain proficiency in the burgeoning field of big data.

The Coastal Institute translates science to make coastal issues understandable and accessible to the non-scientist through varied communication strategies, and community outreach and engagement.

One of the most important—and oft-overlooked—aspects of scientific research is making the results readily available to the general public. To effectively engage our coastal communities, technical-scientific language typical of peer-reviewed publications must be translated and distilled into comprehensible messages accessible to all.

Fading Landscapes: the Fragility of Coastal Beauty



100 Acre Cove, Barrington, RI — artist, Lori Jeremiah.

Narragansett, Rhode Island artist, Lori (Loretta) Jeremiah is best known for her work in pastel and watercolor that ranges from coastal images to nature scenes and portraits. Her work has been in many juried exhibitions, solo and group exhibits, and has earned numerous awards. Jeremiah continues to teach workshops in Rhode Island and Florida. The opening of this show included a panel discussion — Weighting Scientific & Aesthetic Loss of Coastal Habitats — between Jeremiah and salt marsh experts who assisted in the selection of her subject based on their aesthetic value, valuation of a given salt marsh, and their concern for its future in light of climate change. Saltmarsh and ecology experts included Charley Roman (CI), Kenny Raposa (NBNERR), Peter Paton (URI-NRS), and Peter August (URI-NRS). The exhibit premiered during the 2018 GSO Open House and remains open through the summer of 2020 in Studio Blue.

- **CI Support:** \$3,000 average annual.
- **CI Partners:** Lori Jeremiah, GSO, and salt marsh and ecology experts.
- **ROI:** Much is now made of STEM to STEAM and the CI is committed to providing artistic interpretations of the beauty of marine life and our coastal waters. Art promotes emotional learning and can plant a seed of responsive caring in the public that is shown to lead to more significant curiosity about science.

“The Coastal Institute is a vital source of intellectual and financial support for our ocean, climate, and coastal science education initiatives. Without the GIA funds, we would not be able to replace outdated computers, travel to present the results of our work, or engage additional participants. We continue to appreciate the CI’s support greatly.”

—Gail Scowcroft, Associate Director of the Inner Space Center, URI



Spring 2020 Issue of 41° North magazine.

CI partners with Rhode Island Sea Grant to publish Rhode Island's ocean and coastal magazine that examines climate change, marine commerce and recreation, ecology and habitats, ocean planning, and the history of the state's coastal and marine landscape. To conceptualize, research, fund, edit, design, and layout the magazine for distribution, CI Director and Media and Systems Management Specialist partner with RISG's Monica Allard-Cox, who serves as editor-in-chief. 41° North has transitioned from a purely scientific endeavor with a limited readership to a transdisciplinary publication with a broad audience of 16,000. Goals outlined and achieved include professional distribution updated design, reconfigured layout, and improved quality of writing for an interested public. A particular marketing strategy was created for COVID-19 due to a lack of standard distribution outlets (libraries, government offices, and coffee shops), which were closed due to the pandemic. Advertisements were placed in the Boston Globe, Rhode Map, and EcoRI online promotion outlets, and both print and online edition links of the magazine were distributed to local restaurants open for takeout. Over 300 additional subscribers to the magazine have been added since mid-March

—Spring 2020 issue focused on hope in the face of climate change: <https://41nmagazine.org/current-issue/>

—Fall 2019 issue focused on building resilience: <https://41nmagazine.org/fall-2019/>

—Summer 2018 issue focused on exploration: <https://41nmagazine.org/summer-2018/>

- **CI Support:** \$20,000 average per issue.
- **CI Partners:** Rhode Island Sea Grant, GSO.
- **ROI:** Acknowledgement from the public through focus groups, surveys, unsolicited mail, and the successful recent addition of donations demonstrate that the formula is working, once again meeting both the CI's and RISG's missions.

RI Environmental Monitoring Collaborative



CI director or designee chairs this remaining standing committee of the RI Bays, Rivers, and Watersheds Coordination Team in accordance with state law to coordinate environmental monitoring efforts across the state and engage a wide range of institutions and agencies. CI assistant director serves as the designee chair of the RIEMC and produces an annual report.

—Held biannual meetings for the RIEMC to discuss monitoring plans and results as well as possible areas of collaboration.

—Expanded RIEMC roster with new representatives from USGS (New England Water Science Center) and EPA Region 1.

—Continued maintenance of the RIEMC website launched in July 2018 (www.rimonitoring.org), which provides information to the general public and state decision-makers on the importance of long-term monitoring.

- **CI Support:** \$500 annual average; CI assistant director, staff time.
- **CI Partners:** RI Department of Environmental Management (vice-chair), Narragansett Bay Commission (vice-chair), and 19 additional partners from state and federal agencies, nongovernmental organizations, and academia.
- **ROI:** The CI is under a state mandate to chair RIEMC and to provide a joint report on data from state agencies annually. This process is a valuable service in that it gives the public awareness of the health of their environment. It also provides the state government, both the Executive and the General Assembly, with specific information signaling the success or failure of any investment and heralds a warning if data reveal a troubling trend. <https://www.rimonitoring.org/>

Taking the High Rhode: climate change in RI (www.riclimatchange.org)



Photo credit: Bill Thompson.

CI developed this site as part of the RI Sea Grant-funded Climate Change Collaborative. CI provided additional funding and now manages the website to make complex climate science concepts accessible to the general public through the use of everyday language, short videos, cartoons, photographs, and clear explanations to convey the significant threats posed by climate change and what residents can do to prepare.

—Used by Rhode Island and New England high school and college instructors in classroom instruction, Google Analytics shows users stay onsite longer than the standard 2-3 minutes and discerns that there are legitimate users from around the world, including considerable use in several urban areas of India.

—Led to invitations for CI to participate in panel discussions, educational events, and other activities centered around climate change.

—Many excellent web resources on the topic of climate change have emerged from government agencies and NGOs since the launch of riclimatchange.org eight years ago. Since these primarily have a global or national focus, the site is now undergoing major revisions to become more RI-centric. Updates include:

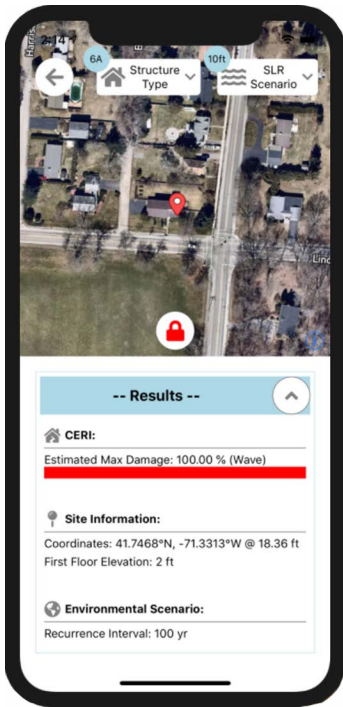
- A series of downloadable PowerPoint presentations (at the introductory undergraduate level) that educators can use for lectures on climate change science. Presentations are being designed to cover approximately 40 minutes of content and cover topics such as earth's climate system, the greenhouse effect, causes of climate change (natural and anthropogenic), and impacts (warming, sea-level rise, storms, precipitation changes).

- Downloadable infographics for use by state/local policymakers highlighting local climate trends and impacts to RI communities.

- A rotating op-ed feature on the site home page with contributions from state leaders, recognized advocates, business owners, researchers, etc.

- **CI Support:** \$40,000 in development and maintenance since 2012.
- **CI Partners:** GSO and CELS.
- **ROI:** Contributes to the CI mission of advancing knowledge and solutions to environmental challenges by strengthening climate literacy among the citizens of RI and sharing climate change adaptation strategies.

STORMTOOLS: smartphone app for flood risk and damages



STORMTOOLS smartphone app for flood risk and damages.

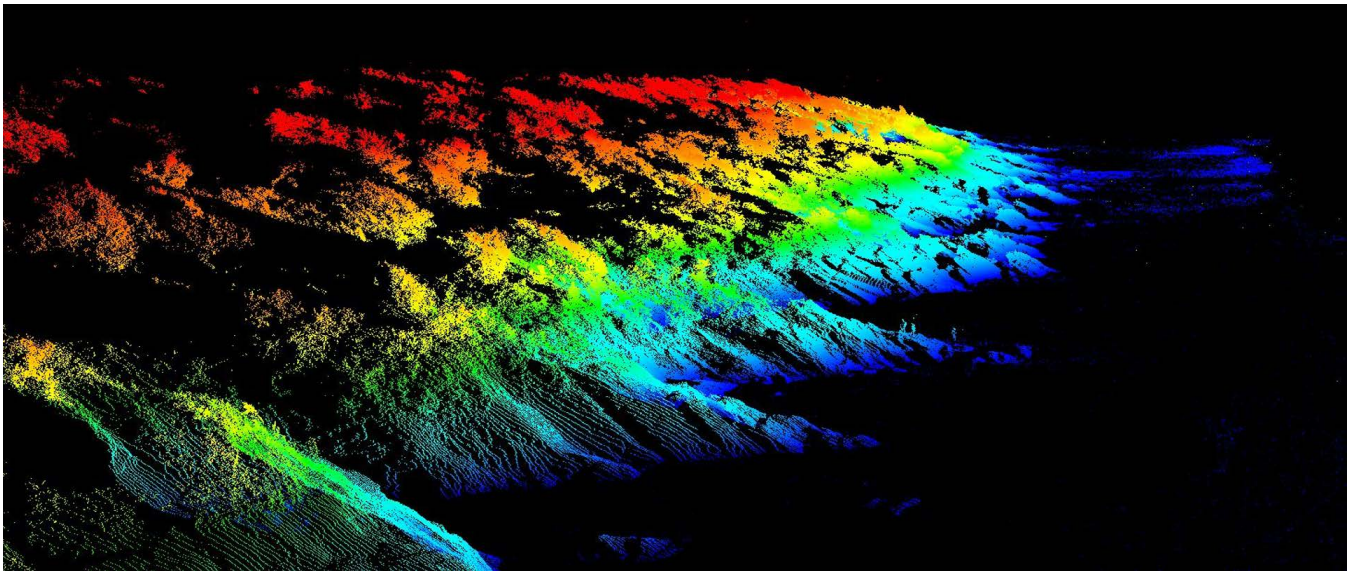
URI's Department of Ocean Engineering, Environmental Data Center, and Coastal Resources Center, working with Rhode Island's Coastal Resources Management Program (RI CRMC), has developed a suite of coastal resilience products (maps and data, collectively referred to as "STORMTOOLS") to assist the state's municipalities in planning for coastal flood events. STORMTOOLS products are similar to FEMA's Flood Insurance Rate Maps (FIRMS), but, importantly, they take into account future sea-level rise. In 2019, the CI began working with the PI (Malcolm Spaulding) on targeted outreach of STORMTOOLS.

—CI assistant director co-authored a paper with colleagues from URI Ocean Engineering, and RPS group on the development of a mobile application, which extends STORMTOOLS risk calculations statewide for anyone with a GPS-enabled smartphone.

—CI assistant director will present as part of a special session — Understanding the Risk to Structures and Infrastructure in Coastal RI — at the 2020 National Coastal and Estuarine Summit.

- **CI Support:** CI assistant director time.
- **CI Partners:** Ocean Engineering, CRC, RICRMC, RPS Group.
- **ROI:** STORMTOOLS products are being used by communities across the state to inform decision on infrastructure enhancement, emergency planning, and coastal resilience.

Rhode Island Coastal Erosion Monitoring Network



Coastal bluff elevations surveyed with LiDAR.

The CI has teamed with GSO, OE, and Rhode Island's Coastal Management Program (RI CRMC) in development of a coastal erosion monitoring system that features terrestrial LiDAR and bathymetry surveys and an array of real-time sensors (wave / current meters and tide gauges) to determine baseline conditions in the coastal environment and monitor their response to storm events. In the near term, the system will be used to evaluate the performance of shoreline adaptation and restoration projects across the state and to establish criteria and guidelines for the siting of future projects. It's also providing much-needed observation data for integration and validation of coastal models, improving our ability to predict the impacts of storms and sea-level rise to Rhode Island's coastal environments.



URI grad student measures erosion on the RI south shore.

—CI leveraging grant awarded to project lead John King to maintain field data collection during the transition to long-term funding sources.

—CI assistant director is co-PI on a proposal submitted to the National Fish and Wildlife Foundation 2020 National Coastal Resilience Fund—Integration of Observation and Monitoring Data with Modeling Approaches to Aid Science-Based Decision Making for Shoreline.

- **CI Support:** \$10,000 leveraging grant, CI assistant director time.

- **CI Partners:** GSO, OE, RICRMC, Eastern CT State University.

- **ROI:** Robust and sustained monitoring of the state's coastal ecosystems will help Rhode Island to keep well ahead of the curve as global climate change impacts our coastal populations, resources, and infrastructure.

URI Watershed Watch



Photo credit: Bill Thompson.

—The CI supported Watershed Watch 10 years ago in the transformation of a then 25-year database of surface water quality in RI (e.g., lakes, ponds, streams, and estuaries), gathered in large part through trained and supervised voluntary citizen scientists. They regularly collect and deliver water samples from all over the state to the RI Watershed Watch laboratory. The CI awarded \$70,000 to support new hardware, software, and a consultant to transfer the storage system from one laptop to a sophisticated database in support of RIDEM's mandated public reporting system. This past year, CI funds supported data analysis and

visualization related to the Watershed Watch Program (WWP). WWP made substantial advances on these tasks in the past year and is now able to generate the required RIDEM reports automatically based on new coding as well as to automate the data input from volunteers and provide more timely and understandable data visualizations of RI water body conditions. Reports will be available on a monthly basis the same year that the data are collected, which should bring more attention to the program results and is a necessity in the current climate of instant access of information.

—Support of RIDEM's mission to monitor and report on statewide water quality.

- **CI Support:** \$2,893.

- **CI Partners:** Watershed Watch Program.

- **ROI:** Robust, accessible, and sustained monitoring of the state's water quality critical to human and environmental health. Increased awareness of URI's contribution to state agencies and local organizations engaged in environmental stewardship activities.

Coastal Institute Student Support

CI employs undergraduate and graduate students to work on a per-project basis focusing on areas including development of communication tools such as primers and presentations and ongoing updates/additions to topic-specific websites for the RI general public, e.g., climate change, environmental monitoring, economic assessment of natural capital. Every effort is made to provide student employees with more of a paid internship model than a job. Students have used CI experience to enhance their grad school, internship, and fellowship applications.

- **CI Support:** \$25,000 average annual support.
- **CI Partners:** Student employees are invited to plan events and meet scholars, artists, fishers, researchers, and others of interest. They are encouraged to attend mentoring events and treated as a team member.
- **ROI:** Enhances the experience of employed students, introduces them to a wide range of career options, enhances their CV, encourages young scientists and marine affairs students, etc. to engage in both research and complementary outreach. Many of our former student employees have gone on to Ph.D. programs in environmental science.



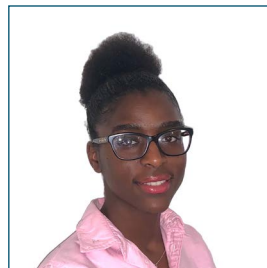
Teresa Schwemmer—Doctoral student at Stony Brook University; worked with CI since her URI undergraduate years.



Becky Gumbrewicz—Master's student at the University of Maine; worked with CI since her URI undergraduate years.



Hannah Klinger—MS Mathematics, URI 2020; worked with CI since her URI undergraduate years.



Milucy Fernandez—BA Computer Science and B.A. French Language, URI 2019; worked with CI since Spring of 2020.



Christine Gardner—MS Chemical Oceanography, URI 2020; worked with CI since Fall of 2019.



Alexandra Moura, Marine Biology Undergraduate, URI; worked with CI 2019-2020.

“This year, I was able to use the GIA funds to help support a graduate student’s summer stipend. These funds are ideal for this purpose, as the student is processing some additional data that were collected opportunistically on the project and will be very helpful for future proposals. The flexibility of the GIA funds to enable this extra bit of work is quite helpful.”

—Dr. Christopher Roman, Professor of Oceanography, URI

CI Staff:

Director Judith Swift, full professor in Departments of Communication Studies and Theatre, Unlimited Appointment in Film Media, Honors Professor. The CI director position is a half-time appointment during the academic year and fulltime in the summer. During the academic year, Swift also teaches one Honors course each semester, serves on graduate committees, mentors students for Honors thesis projects, provides significant university service and directs at least one production in a professional theatre annually, which is creative activity external to the CI. Swift serves as director of the NAC-CESU, leads the STEEP Research Translation Core, oversees the SSEER MOU, serves on the 41° North editorial board, and works in tandem with the CI team on multiple aspects of CI events within the framework of a shared team and shifting leadership paradigm.

Dr. Nathan Vinhateiro, CI assistant director & Associate Research Professor (full calendar year funded by Coastal Institute). Dr. Vinhateiro leads CI science initiatives, including the RI Coastal Erosion Monitoring Network, chairs the legislatively mandated Environmental Monitoring Collaborative, and serves as co-lead of the STEEP Research Translation Core.

Amber Neville, MLS, digital media/systems specialist (full calendar year funded by Coastal Institute) co-leads the CI Climate Demonstration Site in Warren/Barrington (mixed-use), an editorial board member for 41N magazine, co-lead of the STEEP Research Translation Core. Manages fiscal planning, oversight, and distribution of CI funds.

Dr. Charles Roman, CI associate scientist, NRS adjunct faculty, co-leads the CI Climate Demonstration Site in Warren/Barrington (mixed-use), (part-time funded by Coastal Institute).

Dr. Peter August, CI associate scientist, NRS Professor Emeritus (part-time funded by Coastal Institute), leads the CI Climate Demonstration Site at Napatree Point (natural area).

Teresa Crean, community planner and coastal management extension specialist, Coastal Resources Center and Rhode Island Sea Grant CI Climate Demonstration Site Warren/Barrington (mixed-use), (2.0 months funded by Coastal Institute).

Greg Bonyng, Geospatial Extension Specialist, leads the URI Geospatial Extension Program hosted by URI Environmental Data Center. (1.4 months funded by Coastal Institute).

Associate Directors:

- **Dr. Arthur Gold** of NRS/CELS serves as an advisory associate director.
- **Dr. Emi Uchida** of ENRE/CELS serves as a project associate director.
- **Dr. John King** of GSO serves as an advisory associate director.



STEER trainee shares information at Graduate School of Oceanography open house.

CI Project Funding and Grants

The CI awards Grants-in-Aid limited to URI researchers working in the geographic scope of the CI which is broadly defined to include continental shelves, inland or partially enclosed seas, estuaries, bays, lagoons, beaches, and terrestrial and aquatic ecosystems within watersheds that drain into coastal waters. The CI also supports research with Leveraging and Catalyst grants as funds permit.

Grants-in-Aid

One of the primary privileges afforded to Coastal Institute Senior Fellows affiliated with URI is the opportunity to apply for Grants-in-Aid (GIA). CI Senior Fellows are eligible to apply for a GIA (approximately up to the amount that equals one-third of the overhead returned to the Coastal Institute related to that Senior Fellow's funded proposal(s)). A specific amount available for GIA's is emailed to all funded Senior Fellows annually as soon as the returned overhead balance becomes available in August or September. These funds may be used to support activities related to an ongoing funded CI proposal or applied to research or activities aligned with current or future research in keeping with the Coastal Institute mission. Not all requests are approved. Applications must meet the CI mission and relate to funded research.

CI Support: FY20 \$181,503.

CI Partners: College of Arts and Sciences, College of the Environment and Life Sciences (Departments: Biological Sciences, College of Pharmacy, College of Engineering, Environmental and Natural Resource Economics, Natural Resources Science, Landscape Architecture, Cell and Molecular Biology; Environmental Data Center), Graduate School of Oceanography (Coastal Resources Center, Inner Space Center, Office of Marine Programs, RI Sea Grant.)

ROI: Support for senior fellow research, e.g. conference attendance, journal publication, proposal review and development, staff training, lab equipment, computers, field work support, repairs, graduate student funding, summer salary and related costs due to COVID-19.

Leveraging Grants

Senior Fellows, individuals sponsored by a Fellow, e.g., students, or others whose project focus is in alignment with the mission of the Coastal Institute, may apply for funds to enhance sponsored projects. The range of grants varies widely and could support the development of a complex database crucial to the funded research or a luncheon for a site visit of the funding agency. Applications are rolling and depend upon the availability of funds.

CI Support: FY20 \$21,000.

CI Partners: Roger Williams Park Audubon RI, The Nature Conservancy, Mass Audubon, Towns of Warren & Barrington, National Park Service, Coastal Resources Center, Graduate School of Oceanography, ENRE, Stanford University, The Natural Capital Project, RI Historical Society.

ROI: Enhancement of water quality, database management, and improvement of public natural resources, economic analysis, assistance to vulnerable coastal towns.

Catalyst Grants

Senior Fellows, individuals sponsored by a Fellow, e.g., students, or others whose project focus is in alignment with the mission of the Coastal Institute, may apply for funds to support the investigation of a concept or theory. This support could include the use of focus groups to test a particular outreach approach or engaging in a small research project that tests a given hypothesis and provides sufficient "proof of concept" to enable the researchers to seek significant funding from an agency or foundation. Applications are rolling and depend upon the availability of funds.

CI Support: FY20 \$15,000.

CI Partners: Towns of Narragansett, Charlestown, City of Westerly, Graduate School of Oceanography, The Watch Hill Conservancy, Watch Hill Fire District, RI Natural History Survey – Rhody Native Program, RI Coastal Resources Management Council, RI Department of Environmental Management, RI Sea Grant, Eastern Connecticut State University.

ROI: Support for coastal monitoring and data management programs.

Reporting Structure

In the past year, URI enacted an organizational change, and the Coastal Institute now reports to the Vice President for Research and Economic Development, Dr. Peter Snyder. The CI is grateful for the many years of Provost Donald DeHayes' oversight and his ongoing enthusiasm for innovation and passionate dedication to science. He was always happy to join the CI Senior Fellows when he could take time away from his Green Hall habitat for the CI's annual field trips.



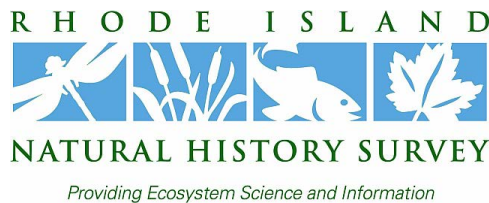
Peter Snyder (circled) joins CI Senior Fellows on 2019 Narrow River field trip. Photo credit: Michael Salerno.

In light of the Coastal Institute's deep commitment to expanding research in coastal zones with interdisciplinary teams, this new reporting structure is a perfect fit with the conceptual model approved by the then Office of Higher Education and RI Board of Governors for Higher Education. They also supported the CI's role in protecting and maintaining an interdisciplinary and multi-agency mission.

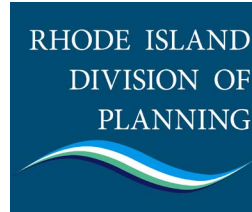
In addition to the formal reporting structure, the CI director had with the Provost's, now Vice President's approval developed a CI Advisory Group consisting of a GSO-based associate director, a CELS-based associate director, an associate project director whose social science or science discipline is project-related and therefore shifts from time to time, and associate scientists. The latter have expertise in and contribute to ongoing CI projects. This collective of associates is called upon to review CI initiatives, provide feedback on future projects under consideration, review catalyst or leveraging grant proposals, and provide guidance on strategic ways the CI might focus on fulfilling its mission in a dynamic environment. The Advisory Group meets annually to review CI initiatives and progress. In accord with Vice President Snyder's approval, associate directors will continue to provide daily advice and feedback.

The CI director meets with the directors and staff of RIDEM, NBEP, and EPA Region I, EPA-AED, RIEMA, and CRMC reasonably regularly to discuss gaps and needs in keeping with the CI's mission. The close association with NBEP has been vital to keeping the big picture in mind, as is the CI director's role as director of the North Atlantic Coast CESU, and the partnership leadership of NBEP with which came the regional perspective of the host entity, NEIWPC. Internal partnerships are also critical and periodically include RI Sea Grant, CRC, academic departments, and interdisciplinary work with multiple colleges. The CI's strength is its flexibility, which is a feature any entity striving to maintain balance in the face of human interaction with a dynamic ecosystem must strive to maintain.

Partners: Fundamental to the CI's Success

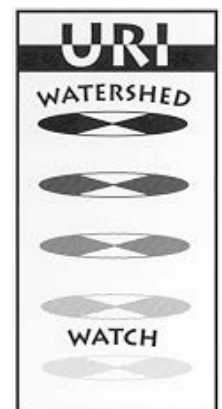


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