



# INVESTING IN OUR COASTS

Interdisciplinary Solutions for Ecosystems  
and Human Interactions

[www.ci.uri.edu](http://www.ci.uri.edu)

THE  
UNIVERSITY  
OF RHODE ISLAND

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Narragansett Bay Campus  
Narragansett, RI 02882

[www.ci.uri.edu](http://www.ci.uri.edu)

Design and infographics by Brandon J. C. Fuller.

All photography by Shed Light Productions, LLC, except as noted below.

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Brandon J. C. Fuller (cover overlay, p14 overlay, p25 overlay)  
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Jarret Katz (CI Team page, table of contents page, p43 background, p47 overlay, p65 overlay)  
Land & Water Conservation Summit (p25)  
Narragansett Bay Commission (p53)  
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Newport Historical Society (p50 *Buy the Bay*)  
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Napatree Point, Port of Providence, and Warren & Palmer Rivers illustrations by Brandon J. C. Fuller.





# FROM THE DIRECTOR

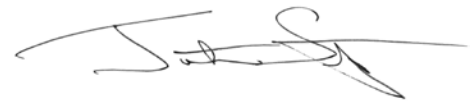
The Coastal Institute (CI) was founded to encourage, support, and expedite interdisciplinary partnerships that first and foremost serve Rhode Island (RI) as a unique coastal state that is ideal as a model to explore compelling coastal problems.

The CI's geographic range extends inland to include activities within the watershed that directly affect the coastal environment and seaward to the edge of the continental shelf. Conceptually, the CI was envisioned as having four clusters that make up its activities: local, which is the most significant focus assisting partner state and nongovernmental agencies, and universities to join in ongoing basic and applied research and outreach; regional, which ranges from bi-state watershed activities to the NAC-CESU; national, which now occurs through invited lectures, conference presentations, and projects designed to provide lessons learned to a broader base of coastal zones; and

international, which currently occurs through allocated Grants-in-Aid and support of publications, travel, and international research. The intellectual scope of the CI is mandated to include both basic and applied sciences in the natural and social sciences as well as engineering. Since its formal approval by the RI Board of Governors in 1998 and inception in 2000, the CI has met its mandate and more. The interdisciplinary mission of the CI remains grounded in the natural and social sciences, but has expanded to include the arts and humanities as well as health sciences. These additional disciplinary areas assist in giving a persuasive voice to the consequences of climate change, to the impacts of emerging contaminants, and to the value of coastal zones that touch on the aesthetics and sense of place. Additional disciplines also provide new ways of thinking and techniques for problem solving in addition to widening the circle of participants in addressing adverse coastal conditions.

Support for CI Senior Fellows amplifies the impact of overhead funds by targeted reinvestment in research, development, and outreach. Return on investment (ROI) results in both tangible and intangible outputs, with each and every investment a strategic part of a

larger plan to address complex coastal management challenges. With each investment, the goal is to increase the funding prospects of CI Senior Fellows and the university writ large, provide on-the-ground support to environmental groups for maximum community level impact, and reinforce the role of the CI as a facilitator of interdisciplinary solutions. By working within the full range of the university's colleges and with state and federal agencies, non-governmental organizations, and networks of academic institutions, the CI is always evolving in the funding, testing, improving and distributing of solutions. The ROI is incalculable in many aspects of its impacts, but this report provides some tangible and quantitative examples, often coupled with intangible qualitative outcomes.



Judith Swift, Director

# THE CI TEAM



## **Judith Swift**

Director, Professor of Communication Studies  
Areas of expertise: science communication and presentation, conflict resolution, strategic planning



## **Nicole E. Rohr, PhD**

Assistant Director, Research Assistant Professor  
Areas of expertise: coastal ecology, environmental monitoring, outreach activities



## **Amber Neville**

Digital Media Communications Specialist  
Areas of expertise: social media, systems management, financial planning and oversight



## **Q. Kellogg, PhD**

Research Associate, Adjunct Assistant Professor, URI CELS Department of Natural Resources Science  
Areas of expertise: watershed hydrology, watershed nitrogen dynamics, large data analysis

## Associate Directors

Serve as advisory council and ambassadors for the CI, assist with strategic planning, contribute, review, and critique CI investments, and provide disciplinary insight and guidance as needed. The Associate Directors receive a small stipend, which they reinvest in coastal research.



## **Arthur J. Gold, PhD**

Chair and Professor, URI CELS Department of Natural Resources Science, Co-director of URI MESM  
Areas of expertise: Watershed Hydrology



## **John W. King, PhD**

Professor, URI Graduate School of Oceanography  
Areas of expertise: Geological Oceanography




## **Emi Uchida, PhD**

Associate Professor, URI CELS Department of Environmental and Natural Resource Economics  
Areas of expertise: Environmental and Natural Resource Economics, Ecosystem Services, Environment and Development



## **Charles T. Roman, PhD**

Retired, National Park Service  
Areas of expertise: Coastal Ecology, Habitat Restoration, Natural Resource Management



“URI’s Coastal Institute has been effective in bringing a number of agencies together to facilitate solutions to a range of environmental management challenges – from managing stormwater runoff, to considering new approaches to fisheries management, to communicating about climate change. Environmental issues are complex, involving many parties and requiring integrated approaches, and RIDEM has benefitted from the CI’s ability to gather data, engage stakeholders, and lead a process that bridges old divides and encourages innovating thinking.

RIDEM has turned to the CI repeatedly for its expertise and assistance in developing policy in challenging areas where it can be difficult for a regulatory agency to make headway. I strongly endorse and appreciate the value that URI’s Coastal Institute brings to Rhode Island and beyond.”

**Janet Coit**  
Director, RI Department of Environmental Management



Learn how the CI is...

[Enriching Coastal Knowledge / 12](#)

[Applying Coastal Science Without Borders / 18](#)

[Catalyzing Interdisciplinary Collaboration / 28](#)

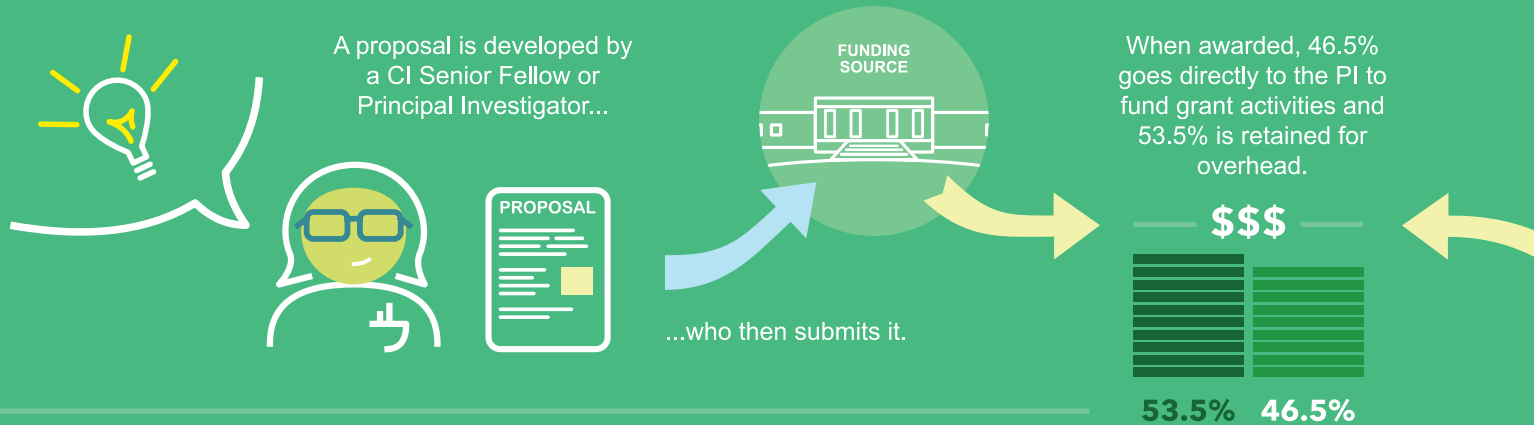
[Communicating Science for Public Engagement / 36](#)

[Creating Transparency in a Neutral Venue / 54](#)

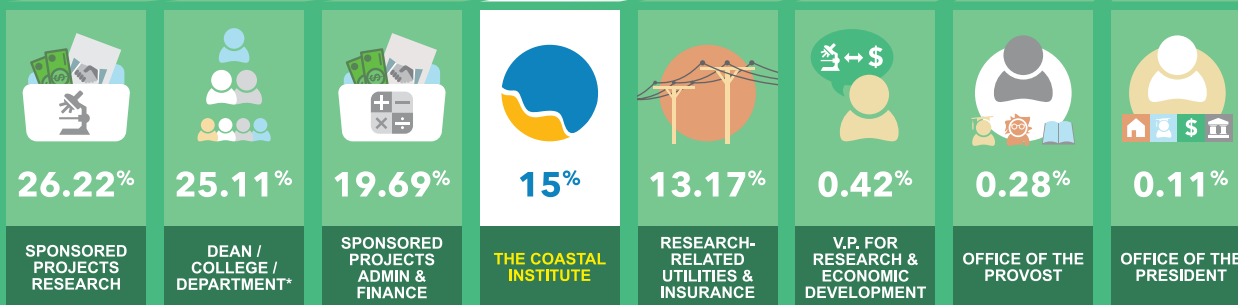
[Investing in the Next Generation / 58](#)

[Supporting Proposal Development / 66](#)

# THE PATH TO FUNDING

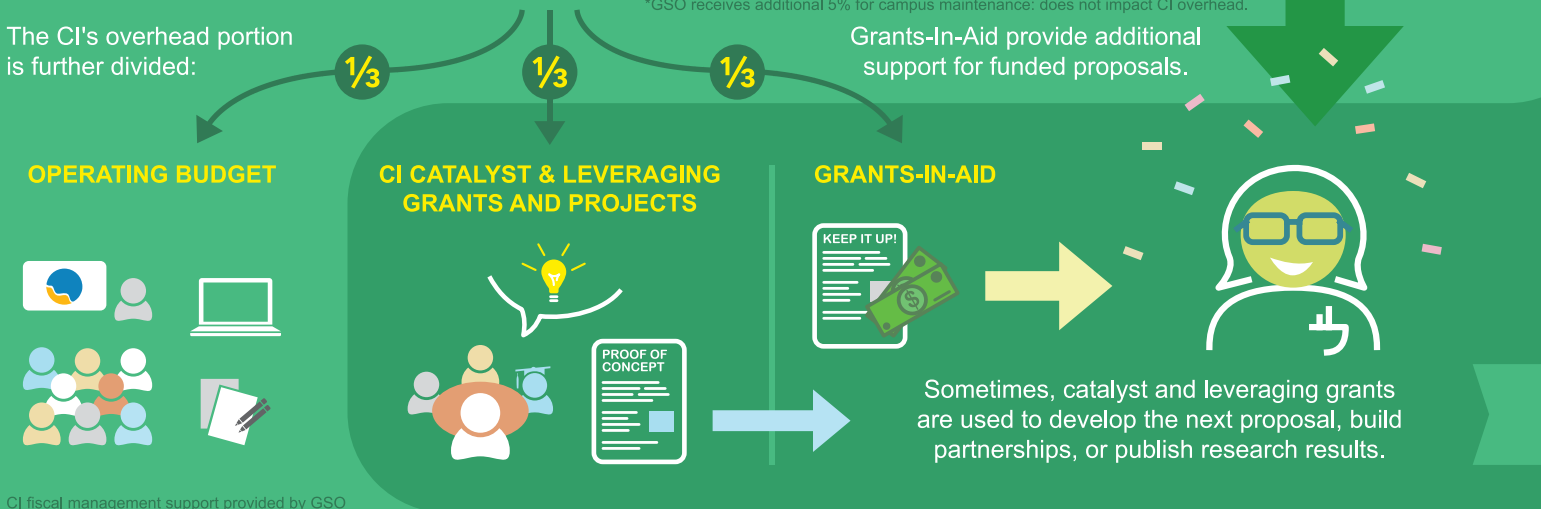


Overhead is distributed to URI offices and colleges.



\*GSO receives additional 5% for campus maintenance: does not impact CI overhead.

The CI's overhead portion is further divided:





# RETURN ON INVESTMENT

GIAs go to the PI based on previous year's proposals to fund...



EQUIPMENT



WORKSHOPS



RESEARCH



STUDENTS

**GRANTS-IN-AID**  
allow the PI to selectively  
reinvest in their own  
research, in alignment  
with the CI mission.

The CI partners on specific projects based on thematic areas, including...



PUBLIC  
ENGAGEMENT



RESEARCH &  
FIELDWORK



EXTERNAL INVESTMENT

**CI PROJECTS**  
benefit the environment,  
the public, and the state;  
are deployable to other  
regions; and can be  
used as models.

Leveraging grants to the PI supplement existing grants for  
unsupported needs like...



MEETINGS



PUBLICATIONS



TECHNOLOGY

**LEVERAGING GRANTS**  
fill underfunded gaps,  
help disseminate grant  
results, and enhance  
URI's reputation.

Catalyst grants are used to stimulate  
interdisciplinary thinking that lead to...



PROOF OF CONCEPT



NEW IDEAS

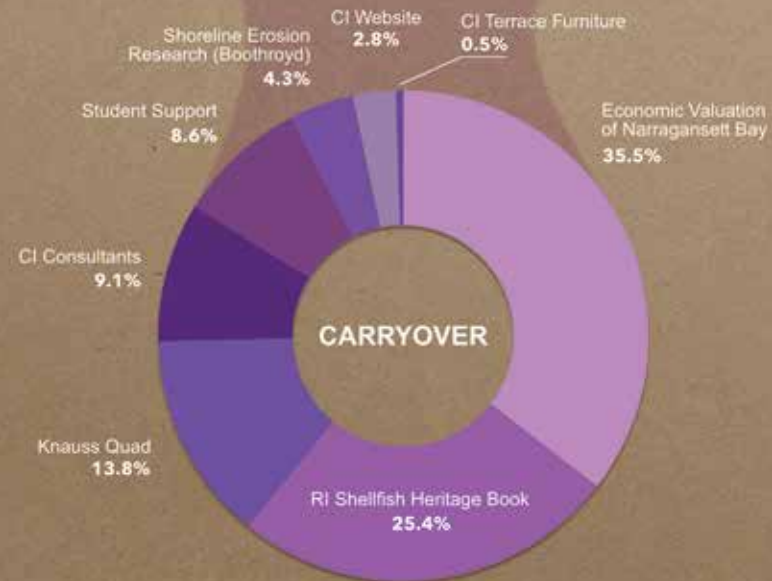
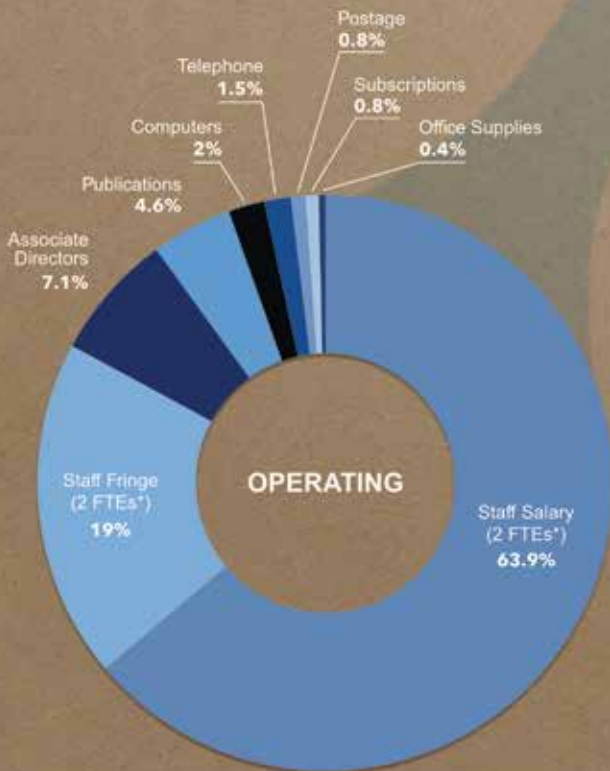
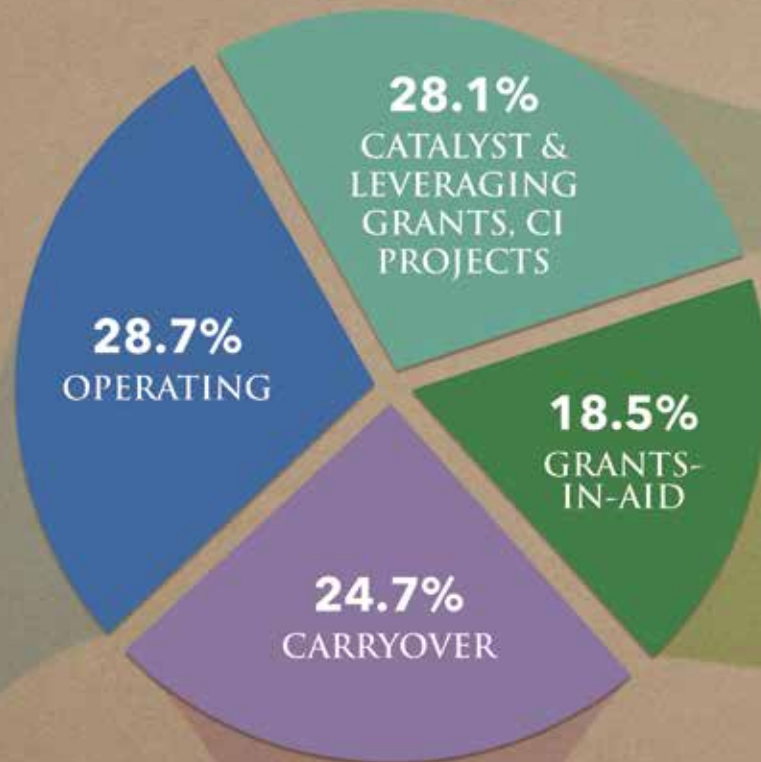
**CATALYST GRANTS**  
to the PI are used to  
develop proofs of concept  
for additional funding.

FUNDING  
SOURCE



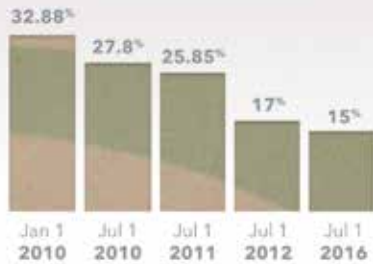
# ILLUSTRATIVE FY16 FUNDING DISTRIBUTION

Coastal Institute revenue is distributed into three broad categories: 1) **Operating** (e.g. personnel, computer equipment, and office expenses); 2) **Grants-in-Aid** (grants to CI Senior Fellows based on returned overhead); 3) **Catalyst & Leveraging Grants and CI Projects** (grants to Senior Fellows and CI Initiatives). In FY16, carryover funds from previous years were used to supplement large-scale, ongoing, multi-year projects and provide additional operating support.

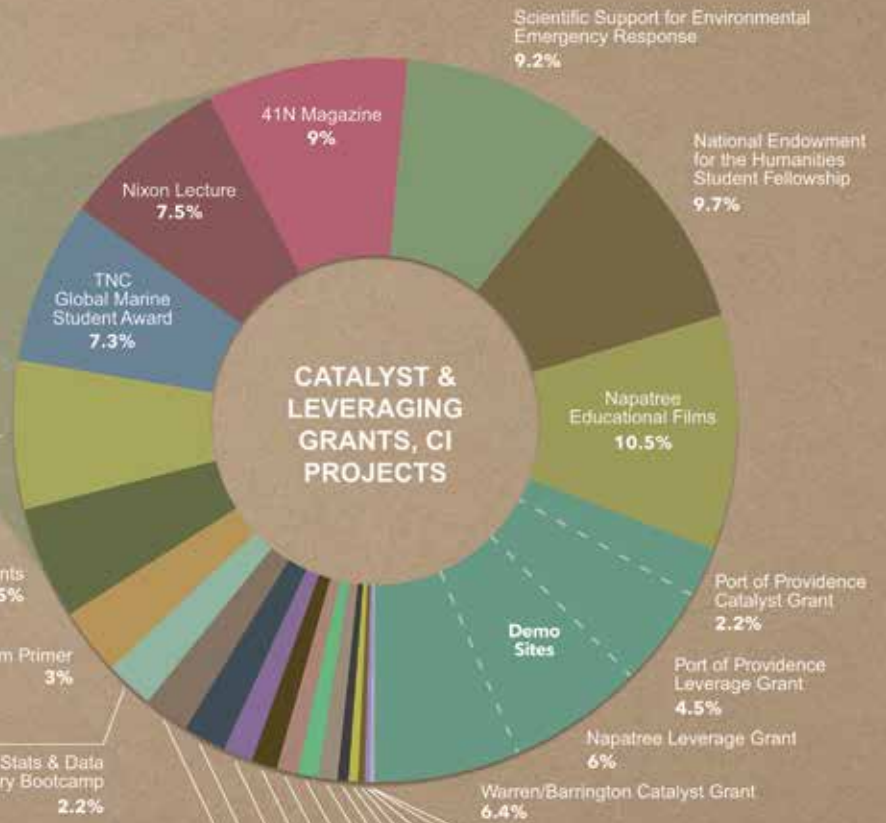


\*Director funding 51% FTE/Fringe; Office of the Provost

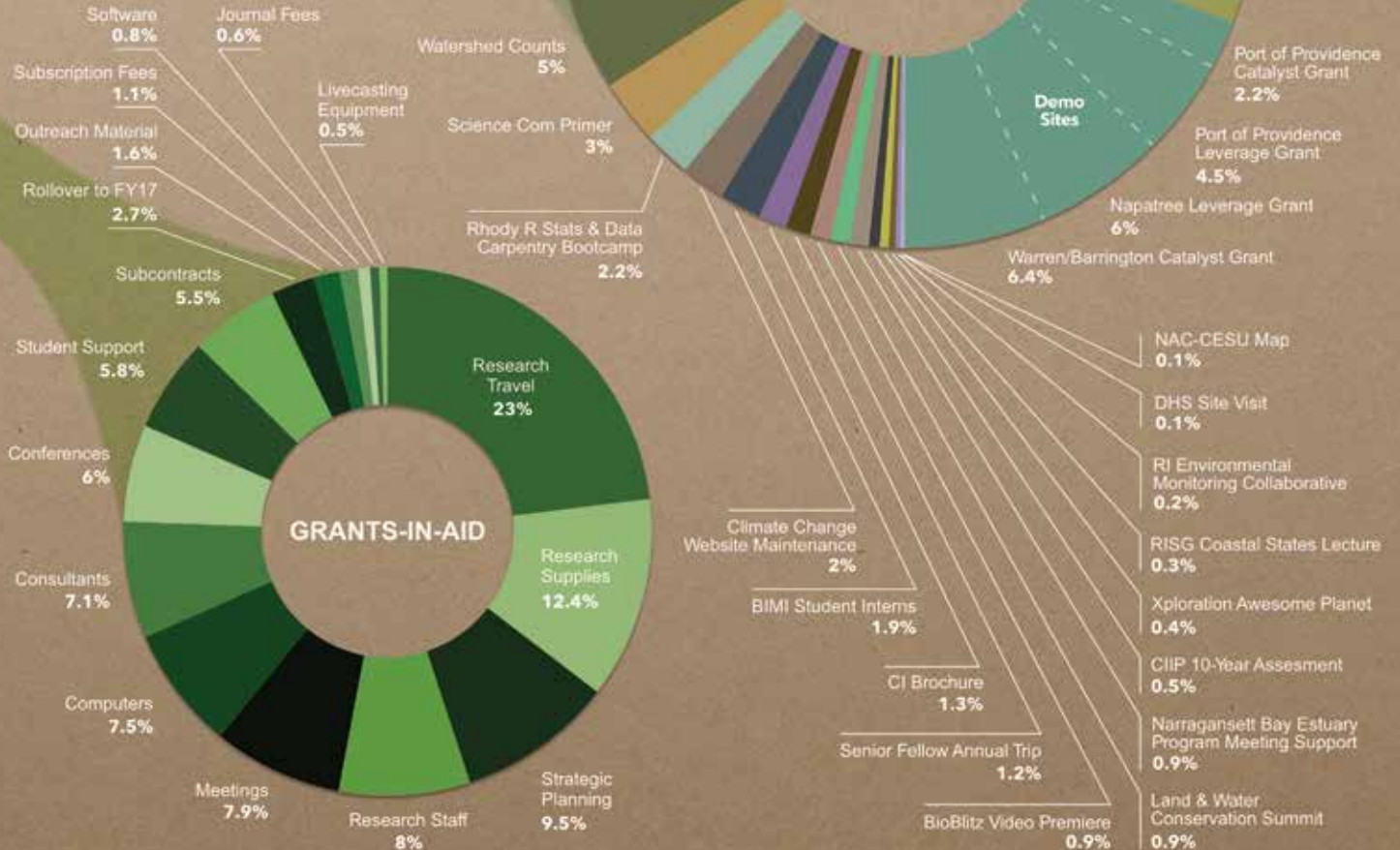
### CI HISTORICAL RETURNED OVERHEAD RATE



### CATALYST & LEVERAGING GRANTS, CI PROJECTS



### GRANTS-IN-AID



A scenic view of a coastal area. In the foreground, a stone wall runs across the frame, with a wooden post topped with a white cap. To the left, a body of water is visible. In the middle ground, there are several trees and a grassy area where a few people are standing. In the background, a large white building and a taller brick building are visible under a clear sky. A large metal tower structure is on the right side of the image.

Section 1:

# ENRICHING COASTAL KNOWLEDGE

# ECONOMIC VALUE OF NARRAGANSETT BAY AND ITS NEIGHBORING ESTUARIES

Given that Narragansett Bay is frequently cited as central to the economic vitality of the bi-state region (RI and MA)—a premise with which government, academic institutions, and private and public industry agrees—there is a strong need for a comprehensive economic assessment, which has not been done for many years. Watershed Counts, a co-led CI & NBEP publication, addressed some aspects of economic indicators ([www.watershed-counts.org/economic.html](http://www.watershed-counts.org/economic.html)), but much more is needed. To address this gap, the CI has enlisted University of Rhode Island's (URI) Dr. Emi Uchida, Professor of Environmental and Natural Resource Economics (ENRE) to lead a five-year study on the value of Narragansett Bay, its bi-state watershed, and neighboring estuaries to the surrounding population and economy, which depend on its ecosystem goods and services.

Despite preservation and restoration efforts by citizens, elected officials, and regulators, indicators show that the environmental quality of the bay is negatively impacted by urbanization, sewage treatment, storm water and agricultural runoff, and other sources of environmental pollution. Areas of deteriorating water quality combined with climate change—Narragansett Bay's primary environmental concerns—are compromising the capacity of the estuary to provide the ecosystem goods and services important to the economy and to quality of life.

This study explores various facets of the region's economy as they relate to estuary resources. These include marine transportation, commercial and recreational fishing, shellfishing, hospitality industries, as well as the less easily quantified sociocultural and aesthetic benefits that a healthy estuary

provides. The study will take five years of research to completion and requires a team of national collaborators, drawn to date from the URI, Stanford University, and Clark University.

In sponsoring this economic research, the CI expects to provide RI's Governor and General Assembly with a deeper understanding of the scale of benefits that Narragansett Bay and its neighboring estuaries deliver. Most importantly, when those seeking to protect the bay and its watershed refer to the system as an economic asset, they will have hard data and solid analysis with which to answer the question, "Narragansett Bay: what's the value?" The answer will offer a vital perspective for all decision makers and the general public in the area. Furthermore, a rigorously conducted study of the bay's value will serve multi-faceted efforts to protect this valuable resource.

## 5-Year Project Plan (2016-2021)

<b>Phase I</b>	Economic Impact of the Narragansett Bay & Neighboring Estuaries
<b>Phase II</b>	Modeling and Valuation of Water Quality
<b>Phase III</b>	Modeling and Valuation of Recreational Fishing, Beach, and Other Recreational Uses
<b>Phase IV</b>	Modeling and Valuation of Coastal Resiliency and Energy
<b>Phase V</b>	Modeling Toolkit

**CI support:** \$62,522 to date. The total cost of this study is projected to be approximately \$650,000 with considerable future funding coming from the CI; however, additional funds are being sought. Recently, funding in the amount of approximately \$255,000 was leveraged from the U.S. EPA's Southeast New England Program for Coastal Watershed Restoration as part of a larger grant secured by Dr. Uchida, the URI Coastal Resources Center (CRC), and Massachusetts Audubon Society. This grant will fund a large portion of the budget for Phase II.

# NORTH ATLANTIC COAST COOPERATIVE ECOSYSTEM STUDIES UNIT

URI serves as host for the North Atlantic Coast Cooperative Ecosystem Studies Unit (NAC-CESU), with the CI director serving as director. The NAC-CESU is one of 17 CESUs across the US that provide research, technical assistance, and education to federal land management, environmental, and research agencies. The NAC-CESU has grown significantly since its founding in 1999. Today, there are nine federal agency partners, one tribal partner, and 25 non-federal partners. The non-federal partners (universities and non-profit research organizations throughout the northeast) conduct studies, and in cooperation with federal scientists and managers, provide a scientific foundation for federal agencies to address their multiple coastal resource management challenges.

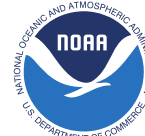
Research is actively conducted through the NAC-CESU with the majority of the projects supported by the National Park Service (NPS) and the Bureau of Ocean Energy Management (BOEM). For example, NPS-supported research to understand the response of coastal park units to Superstorm Sandy exceeded \$4.3M in funding to URI alone, generating returned overhead of \$752,500 for URI. As host of NAC-CESU, the CI and URI both benefit as federal scientists (from NPS and USGS) are stationed at URI, providing numerous funding opportunities for students and faculty. The NAC-CESU has also fostered collaborations among universities as exhibited by URI-GSO's leadership in a coastal

park submerged habitat mapping project (from MA to VA) in partnership with Rutgers University, University of Delaware, and the Center for Coastal Studies (Provincetown, MA). Also of note, URI graduate students supported by federal NAC-CESU funds have become valued environmental stewards and successfully secured federal agency jobs with USGS, USFWS, NPS, and EPA. Current and future requests for proposals from the participating federal agencies are heavily focused on adapting and planning for climate change, aligning the directives of the NAC-CESU with the imperatives of the CI. The CI's administrative support of the NAC-CESU is amply rewarded with funding for targeted research.

**CI Support:** director's time, three to four days per month

[www.naccesu.org](http://www.naccesu.org)

## Federal Partners



U.S. Army Corps of Engineers®



Non-Federal Partners ►





**rhodyRstats**  
corruption free data

The demand for individuals trained in data analysis grows as data increasingly drive the growth of new disciplines and transform existing ones. Recognizing this worldwide demand, the CI partnered with the US Environmental Protection Agency's Atlantic Ecology Division (EPA-AED) to provide hands-on opportunities for scientists to gain advanced programming skills. The specific goal of this effort was to increase the pool of individuals trained in data science and the popular programming language "R," which is used for statistical computing and data science, as well as to facilitate collaboration—across campus, with our local federal partners, and internationally.

As a first step, 44 URI students, faculty, and staff were invited to take part in a two-day workshop, January 12-13, 2016, focused on "R" and to join the newly established "rhodyRstats" Mozilla Science Lab Study Group. The initiative continues to build momentum with the CI's support of ongoing work sessions, development of a logo, support of a graduate student coordinator, and hosting of ongoing Data Carpentry workshops to ensure these resources and opportunities continue to be available to the URI community as well as sister institutions.

**CI support: \$8,213**

[www.rhodyrstats.org](http://www.rhodyrstats.org)

"With the CI support for several rhodyRstats and data carpentry workshops, we have provided data and computational skills to well over 100 different learners in fields as diverse as oceanography, environmental science, rhetoric, and health analytics."

Dr. Jeffrey Hollister, RI Environmental Protection Agency

"The CI provided Watershed Watch the means to share data and results quickly, saving numerous hours of staff time previously spent searching and collating data for mandated reports, research needs, and watershed group requests."

Linda Green, director, Watershed Watch

## URI WATERSHED WATCH

For 28 years, URI Watershed Watch has been coordinating hundreds of volunteers to collect water samples from RI's rivers, lakes, streams, and coastal ponds. These samples form the basis of the RI Department of Environmental Management's (RIDEM) required reports to EPA, and data collection and analysis is supported by numerous sources, including RIDEM, URI CELS-Cooperative Extension, and 45 local program sponsors, among others. Until recently, however, Watershed Watch relied on individual, static excel spreadsheets to store and share these data, which was not an efficient process to support state reporting mandates.

To modernize this data management process, the CI provided a \$100,000 Leveraging Grant to Watershed Watch to develop a comprehensive database to improve management, integration, interpretation, and sharing of data and to provide timely water quality information to members of the public and professionals alike.

Through the CI's support of a database development professional, a robust database was created to manage the nearly a half-million lines of data previously generated by Watershed Watch. Staff can now respond to inquiries within seconds, providing data carefully documented in accordance with industry standards. These data are critical to RIDEM for water quality assessment and management, a service to all RI residents, and improvements to the database management increase reporting efficiency and decrease potential errors.

The CI's investment in the first stage of database development allowed Watershed Watch to implement much-needed improvements to information systems and data sharing.

**CI Support: \$100,000**



# SHORELINE CLEANUP AND ASSESSMENT TECHNIQUES TRAINING FOR NOAA'S EMERGENCY RESPONSE DIVISION

Emergency responders are under increasing pressure from the escalation of events connected to climate change (e.g., coastal storms, flooding), and therefore it is critical to provide training opportunities for experienced and new responders. The CI supported NOAA's Senior Scientific Support Coordinator to convene a three-day training on Shoreline Cleanup and Assessment Techniques for over 30 federal, state,

and non-profit first responders from RI, MA, and Long Island—including representatives of URI, RIDEM's Office of Emergency Management, US Coast Guard, Cranston Fire and HazMat, and Save The Bay. Participants reviewed case studies and took part in field exercises at various RI shoreline locations. These onsite exercises prepare attendees to employ timely and effective clean up techniques, photo

documentation, and habitat identification in response to future environmental emergency situations. Coordination of hands-on training is part of the CI's mandate to enhance emergency planning, response, and recovery throughout the state and region.

**CI Support: \$1,200**



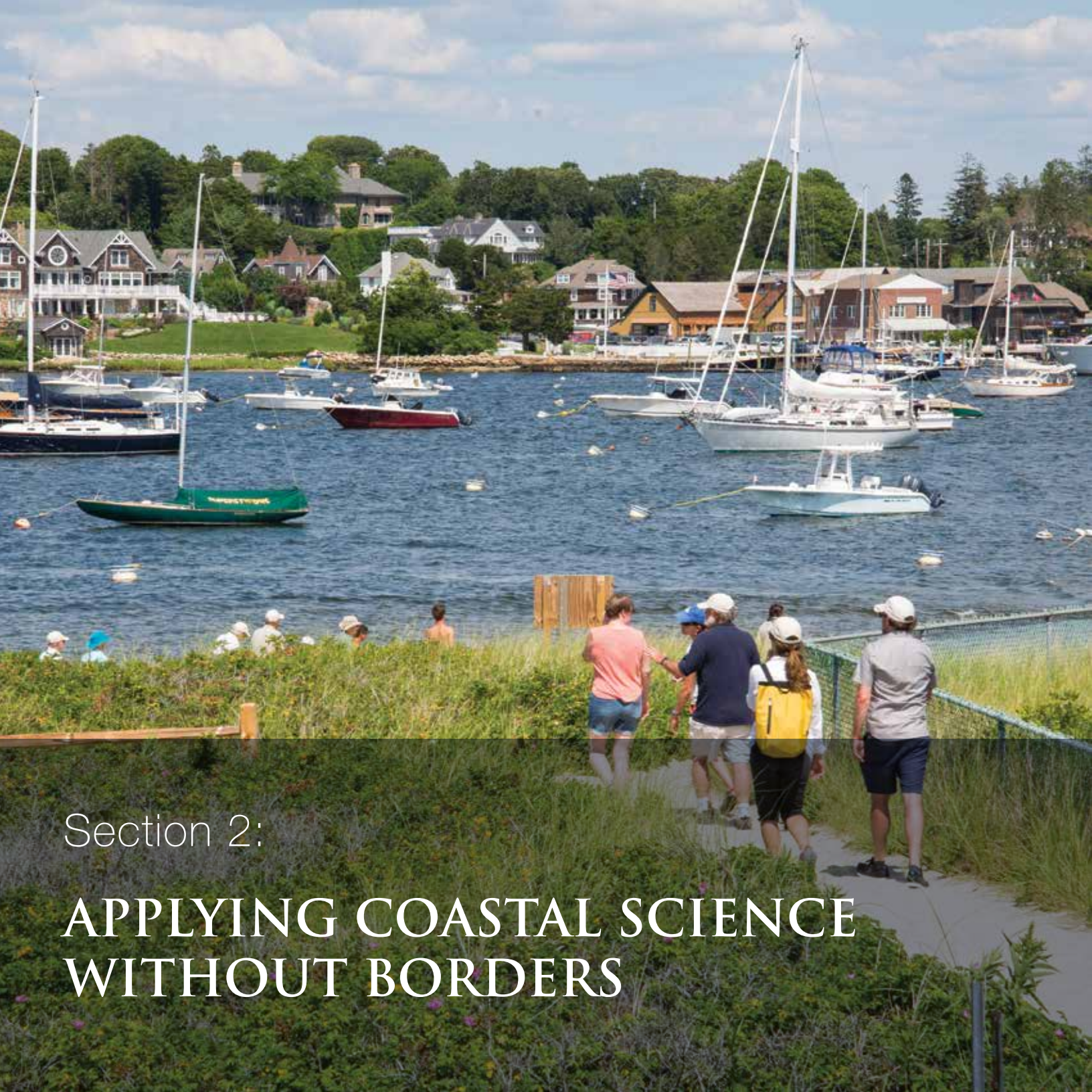
## Supporting RI's Wild & Scenic Rivers – The Wood Pawcatuck

The CI provides support for the Wood Pawcatuck Watershed Association for their ongoing monitoring of the Wood Pawcatuck River, which was recently designated a National Wild & Scenic River.

**CI Support: \$12,850**

*“When the USGS temporarily suspended funding for the USGS stream gauge at Wood River Junction, the CI provided emergency funding to keep it operating... allowing a continuous stream flow record to be maintained at this important location for the state’s drought and flood forecasting network.”*

Christopher J. Fox, Executive Director, Wood Pawcatuck Watershed Association



Section 2:

# APPLYING COASTAL SCIENCE WITHOUT BORDERS

# COASTAL INSTITUTE CLIMATE CHANGE DEMONSTRATION SITES

The CI is collaborating with partners on three climate response demonstration sites representing the range of RI's coastal landscape types: natural areas, urban ports, and mixed-use sites.

Throughout RI there is much discussion on resilience and adaptation approaches. Drawing from these discussions and supported by adaptation strategy research, these demonstration sites are exploring effective approaches and best practices currently being implemented in RI and throughout the northeast coastal region. CI demonstration sites will provide state and municipal governments, planners and policymakers, businesses, homeowners, landowners, and others with historic and anticipated data on climate change impacts and suggested adaptation strategies to implement in anticipation of

increased sea-level, severity of storms, storm surge, and flooding. These sites also demonstrate the benefits of large-scale collaboration for each site, requiring input from town, city, and state governments, individual landowners, community groups, conservation organizations, and on a larger scale from multiple disciplines within academia in order to succeed. The CI will help build collaborations, provide catalyst funding to project investigators, and serve to widely disseminate the findings on coastal resilience and adaptation throughout RI coastal communities and along the East and Gulf Coasts.



*“The CI’s support for an in-depth analysis of the economic value of Narragansett Bay and its Watershed is both essential and timely. I expect the report to influence policymakers and stakeholders considering protection of the Bay, as such the return on this research investment will be large. Further, the CI invests in young researchers, such as myself, building capacity that will continue to pay off for decades to come.”*

Corey Lang, Assistant Professor / Graduate Program Director, URI ENRE, CELS





## Natural Area Climate Response Demonstration Site: **NAPATREE POINT, WATCH HILL, RI**

At Napatree Point, research focuses on monitoring ecosystem changes in response to storms and, more importantly, on tracing evidence of natural recovery over time. The Napatree Point Conservation Area (NTPCA) stands to demonstrate the ways in which environments are resilient to, yet also dependent on, episodic events—such as major storms—for long-term sustainability. Research efforts at NTPCA have been ongoing for several years in

collaboration with Watch Hill Conservancy and the Watch Hill Fire District; however, CI support has furthered invasive plant removal, Rhody Natives plantings, lagoon research, and elimination of cross-dune social trails.

**CI Support:** \$17,400 education video, \$10,000 Catalyst Grant, \$17,200 Leveraging Grant, CI assistant director research, additional CI staff time outreach and videos



“The Napatree stewardship projects resulting from Coastal Institute Catalyst and Leveraging Grant support have served as a learning laboratory for undergraduate and graduate students.”

Peter August, URI Natural Resources Science, and  
Janice Sassi, Watch Hill Conservancy & Watch Hill Fire District,  
Leads for the Napatree Point Demonstration Site

Urban Ports Climate Response Demonstration Site:  
**PORT OF PROVIDENCE,  
PROVIDENCE AND EAST PROVIDENCE, RI**

The Port of Providence (PoP) represents the particularities of resiliency and adaptation along highly developed urban shorelines. Urban ports are often protected by hardened shorelines with industrial commercial activities, such as oil and gas off-loading and wastewater treatment facilities, as well as areas of historic maritime value and settlements of diverse populations. Because of this, urban ports have high local and regional

economic significance. CI-supported research evaluates the distinctly urban complexity of engineering, economic, environmental, and societal challenges that must be addressed as adaptation approaches are developed, applied, and considered as models for use elsewhere.

**CI Support:** \$5,086 Catalyst Grant,  
\$13,842 Leveraging Grant



“With the Coastal Institute’s support, we were able to cross disciplinary boundaries and pilot new techniques for creating scientifically-credible visualizations of coastal disasters. This work has been recognized as cutting edge on the local, state, and federal levels and CI investments have been leveraged to attract funding from the Rhode Island Foundation and the CRMC to continue development of these tools. This proof of concept work will also be used to attract new funding going forward.”

Austin Becker, Professor, URI Department of Marine Affairs  
and Lead for the Urban Ports Demonstration Site





Visualization shows the progress of Hurricane Carol (1954) at the Field's Point site in Providence, simulated in the contemporary port. Visualization created by Peter Stempel of the URI Marine Affairs Visualization Lab, which is led by Dr. Austin Becker. Hydrodynamic modeling provided by Dr. David Ullman.







## Mixed-Use Climate Response Demonstration Site: **WARREN AND PALMER RIVERS, RI**

Because of the beneficial data and models being generated by the natural and urban demonstration sites, the CI continues to expand its coastal change research support, selecting the Warren and Palmer Rivers to be the representative mixed-use demonstration site. Mixed-use areas are common along the RI coastline, where climate change poses an extraordinary challenge for these commercial and residential communities characterized by town centers, historic structures, maritime heritage sites, natural shorelines and

habitats, and diverse populations. In coordination with town officials and local partners as well as complementary to work being done by CRC and the URI Department of Landscape Architecture, work in Warren and Barrington will focus on development of best practices coupled with assessments of the economic costs, socio-cultural implications, and environmental considerations that may be associated with adaptation actions.

**CI Support: \$10,650, CI staff time**



*“The issues are complex as mixed-use coastal communities consider adaptation actions in response to sea level rise and storm surge that will serve to maintain their rich historic, economic and societal character, while also addressing the need to preserve and facilitate the long-term sustainability of salt marshes and other estuarine habitats that are intermingled with developed areas.”*

Charles Roman, Retired, National Park Service,  
co-lead for the Warren and Palmer Rivers  
Demonstration Site along with Amber Neville,  
URI Coastal Institute.

*“The CI was instrumental, as a host entity, in initiating and facilitating the revamping of the Narragansett Bay Estuary Program. As the Town Manager of Warren, RI, I look forward to working with the CI in the development of a Climate Response Demonstration Site focused on the unique challenges of Warren and Barrington as mixed-use coastal communities.”*

Jan H. Reitsma, Town Manager, Warren, RI

# NARRAGANSETT BAY ESTUARY PROGRAM

The CI served a critical role in the recent reorganization of the Narragansett Bay Estuary Program (NBEP) and continues to serve in leadership positions to ensure excellence in its outreach and programming. NBEP, which was founded in 1987 as part of the EPA's National Estuary Program Clean Water Act, was a diffuse organization with three host entities, one of which was the CI. NBEP experienced challenges that ultimately resulted in a review of the program and the EPA issuing a Corrective Action Plan (CAP). The CAP led to the selection of a new host entity, the New England Interstate Water Pollution Control Commission

(NEIWPCC) and staff. The director of the CI serves as chair of the NBEP Executive and Steering Committees, and has worked intensively on the restructuring of the NBEP to address tasks outlined in the CAP. Among the many improvements to the NBEP are the development of a Science Advisory Committee (SAC), which is chaired by a member of the GSO faculty and associate director of the CI (Dr. John King). The SAC both represents a wide range of disciplines and captures expertise relevant to the bi-state nature of the Narragansett Bay Watershed. The CI staff are playing a significant role in the development of the federal-

ly-required Status & Trends Report as well as the co-led annual publication of Watershed Counts. Today, the NBEP Steering Committee has been expanded to include bi-state representation with members representing MA and RI agencies, NGOs, advocacy groups, and academic institutions. The considerable outlay of CI staff time and expertise serves the NBEP as a critical organization due to its role as a synthesizer of both empirical and applied research throughout the bi-state watershed.

**CI Support: \$3,415, CI staff time**



# THE LAND AND WATER CONSERVATION SUMMIT

“The CI supported the Land & Water Conservation Summit which, enabled over 320 state conservation leaders from land trusts, conservation commissions, watershed organizations, as well as folks from local, state and federal agencies to attend workshops presenting the latest information on climate change, green energy, land and water conservation and stewardship. Participants leave the Summit inspired and with new ideas and information to help them more effectively protect the land and waters in communities around the state.”

Meg Kerr and Rupert Friday, Co-Coordinators,  
Land & Water Conservation Summit

For the past 10 years, the CI has been a strong supporter of the Land and Water Conservation Summit, held annually on the URI campus. CI support ranges from defraying workshop costs, partial underwriting of speakers, and the CI director serving as the emcee. This daylong event addresses the work and needs of land trusts, watershed organizations, and conservation commissions. Items on the extensive menu of workshops serve to address new tools, best practices, and methods for communicating with the public. Local organizations are part of the fabric of their communities,

making them best situated to understand environmental health needs and community capacity to enact change. The CI invests in the summit because this annual event strengthens connections within and between communities, informs strategic planning, and improves effectiveness of local projects and programs.

**CI Support: \$1,200 annual average**

Governor Gina Raimondo (D-RI) speaks at the Land & Water Conservation Summit.





Section 3:

# CATALYZING INTERDISCIPLINARY COLLABORATION

# SCIENTIFIC SUPPORT FOR ENVIRONMENTAL EMERGENCY RESPONSE



The CI is ready to rapidly deploy a group of scientists to respond to environmental emergencies in a neutral and unbiased way.

Scientific Support for Environmental Emergency Response (SSEER) is a Memorandum of Understanding with the RIDEM enabling a state agency to activate university resources in the assessment, reduction, or remediation of threats to public health and safety and the environment. This partnership improves environmental emergency preparedness, response, and recovery in RI. Accordingly, the CI maintains a robust roster of university and statewide expertise and resources that stand ready to assist the state in responding to an environmental emergency. The CI coordinates the network of scientists and implements the agreement with RIDEM. Each summer, the CI provides training workshops in preparation for the hurricane season with complementary lectures and workshops throughout the year. More information regarding the workshops can be found on the CI website ([ci.uri.edu/ventures/sseer/](http://ci.uri.edu/ventures/sseer/)). By maintaining its support for SSEER, the CI continues to demonstrate the wealth of reputable resources—material and intellectual—produced at URI and sister institutions. The CI is in the process of creating a centralized location for



disaster response resources, and will soon be offering a workshop on chain of custody, which is critical for federal or private responsible party reimbursement for assessed damages. Other East Coast and Gulf communities are showing interest in the SSEER model. The CI is frequently asked to provide information on this model; just last spring, the director was invited to offer a workshop on SSEER processes at Louisiana State University. Perhaps

most importantly, the best-prepared experts are trained to deploy in service of the state, which is an appropriate model for a land grant university.

**CI Support:** \$8,400 annual average, CI Director coordinates

# COASTAL INSTITUTE SENIOR FELLOWS ANNUAL MEETING AND FIELD TRIP

The Senior Fellows are the heart and soul of the CI.

These 125+ interdisciplinary scholars and practitioners constitute the communal expertise that the Coastal Institute brings to bear in resolving environmental problems in coastal ecosystems. Due to the variety of disciplines and projects in which Senior Fellows collectively engage, their work contributes to a URI reputation synonymous with scientific leadership far beyond the boundaries of our own RI coastal communities.

Each year as part of the annual Senior Fellows meeting, the CI orchestrates a field trip that provides insight into the health of a particular ecosystem or an innovative solution in the Narragansett Bay watershed. The CI selects a location that demonstrates specific coastal challenges and innovative solutions. The result is a day of learning where Senior Fellows speak about the impacts of their CI-supported research and community engagement activities. Fellows often leave with creative ideas and new collaborators; in fact, many grant proposals are hatched at a CI field trip.



**CI Support:** \$1,200 annual average



## 2016 Senior Fellow Trip to Napatree Point Conservation Area in Watch Hill, RI.

The residential community on Napatree Point was completely destroyed during the 1938 Hurricane; Napatree Point is now an extraordinary conservation area. Fellows learned about the cultural history of Napatree and were given an overview of the ecology ranging

from the movement of small grains of sand during coastal storms to the thousands of miles long migration that two-ounce piping plovers embark on from the beautiful beaches. This setting challenged Senior Fellows to holistically think about their own research, and to

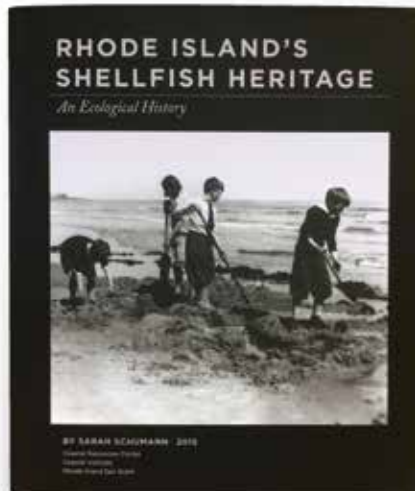
consider the interconnectedness and social implications of natural systems. Napatree represents a myriad of projects and the ripple effect of their impacts that can grow from an initial investment in just one place.





# RHODE ISLAND'S SHELLFISH HERITAGE: AN ECOLOGICAL HISTORY (2015)

The CI made a substantial investment in the RI Shellfish Heritage publication, aiding in its high quality production and broad distribution. Working with Rhode Island Sea Grant (RISG) and CRC, the CI partnered to chronicle the ecological, economic, and cultural history of shellfish in RI as a complement to the technical Shellfish Management Plan, which was developed with RIDEM and Rhode Island Coastal Resources Management Council (CRMC) with representatives from Roger Williams University and URI. Author Sarah Schumann examines the local shellfish industry from the earliest recorded harvests to present day. The book's primary focus is on the economic importance of shellfish to harvesters, farmers, and distributors. In addition, it also highlights the importance of shellfish to ecosystems as filter feeders that "clean" the water, to artists inspired by their beauty to engage in decorative arts, and to recreational diggers who teach generations of children to appreciate coastal ponds as they learn what it means to "hunt and gather" their own food. Many of the fishermen interviewed are from second-generation families. This book pays tribute to their often undervalued skill and presents a serious profile of the industry's economic and cultural



contribution to RI as far back as the state's pre-European settlers. In doing so, it demonstrates the continued social importance of the shellfish industry and engenders a renewed sense of respect and understanding for these labors.

Schumann's book was the winner of the "Innovation in the Humanities" award from the RI Council for the Humanities for its "powerful use of the humanities to connect cross-sector stakeholders." The CI, CRC, and RISG made the book

available free of charge to the public, local libraries, and online, fostering greater investment in local RI heritage and demonstrating the positive results of interdisciplinary engagement.

**CI Support:** \$61,305

[shellfishheritage.seagrants.gso.uri.edu](http://shellfishheritage.seagrants.gso.uri.edu)

Sarah Schumann, herself a shellfish harvester, delved into the history of shellfishing in Rhode Island, researching historical records and conducting interviews with shellfish industry members, many of whom recounted stories of their family's involvement in the industry going back generations. **Monica Allard Cox**, editor and designer, worked with a team from the University of Rhode Island to gather historic and contemporary photographs and illustrations about everything from 19th-century clambakes to early 20th-century oyster houses to today's shellfish restoration efforts. The result, *Rhode Island's Shellfish Heritage: An Ecological History*, is a comprehensive look at shellfish in Rhode Island - the variety of species that are caught or harvested commercially and recreationally, processed and distributed worldwide, appreciated in art and literature, and enjoyed at seaside restaurants after a long day at the beach.

## ◀ Past Senior Fellows field trips

**Clockwise from top left:** Windmist Farm and Watson Farm (2012), Napatree Point Conservation Area (2013), Scituate River and Eco-Machine (2014), Dam and upper bay boat tour, including Port of Providence (2015)







Section 4:

# COMMUNICATING SCIENCE FOR PUBLIC ENGAGEMENT

# SCOTT W. NIXON LECTURE

The CI established the Nixon lecture series upon Scott Nixon's death to honor his extraordinary contributions to coastal science. Some viewed Scott as a contrarian, but in truth, he was a scientist who was always willing—indeed, he saw it as his responsibility—to consider the alternative. When others were focused on ridding Narragansett Bay of nutrients, he asked how much is too much. He even questioned if the continued reduction of nutrients might create an oligotrophic estuary incapable of sustaining life in any abundance. Scott considered the unintended consequences of every action. To honor his legacy, the CI invites speakers to URI who hold less “popular” perspectives or whose work questions the consensus in a given research area.

This highly regarded lecture series generates a broad interest and enthusiasm among coastal researchers across New England as well as among the very engaged coastal communities of RI. In bringing guest speakers to URI, the lecture facilitates these researchers meeting with numerous graduate students and faculty from GSO and College of the Environment and Life Sciences (CELS) as well as researchers from NOAA, EPA-AED, and other institutions throughout the region. By building relationships with this international network of lecturers, this CI lecture series serves to enrich contacts for both Senior Fellows and URI students. In addition to the lecture, the CI supports a range of activities: a luncheon for graduate students, dinners with small groups of researchers, a field day to engage the guest in local research challenges, and individual appointments to provide opportunities to explore collaboration.



▶ **2016: Daniel Conley**  
Lund University, Sweden  
*Getting Rid of Hypoxia in a Warming World*



◀ **2015: Sybil Seitzinger**  
International Council for Science,  
International Geosphere-Biosphere  
Programme, Sweden  
*Nitrogen—the good, the bad, and the beautiful*



▶ **2014: Ariel Lugo**  
USDA Forest Service, International Institute  
of Tropical Forestry, Puerto Rico  
*The Scott Nixon Effect on the Analysis of  
Tropical Ecosystems: From Parking Lots to  
Rainforests*



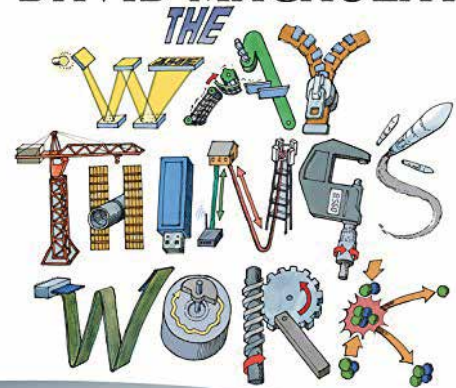
◀ **2013: Carlos Duarte**  
Oceans Institute at the University of  
Western Australia, Spanish National  
Research Council at the Mediterranean  
Institute for Advanced Studies, Spain  
*Auditing the Seven Plagues of Coastal  
Ecosystems*

# ILLUSTRATING SCIENCE

The CI engages artists, designers, and illustrators to better communicate scientific complexity.



## DAVID MACAULAY



FROM LEVERS TO LASERS, WINDMILLS TO WI-FI,  
A VISUAL GUIDE TO THE WORLD OF MACHINES



Left: Author and illustrator **David Macaulay** speaks at the University of Rhode Island about his illustration of the intricacies of science, technology, and architecture in an artful and humorous way.

Right: The update to the worldwide bestseller *The Way Things Work*, titled *The Way Things Work Now*, features new material on developments from touchscreens to 3D printers.

Artist **Art Mead, Jr.**'s cartoons depicting the challenges of climate change for the Waves of Change website

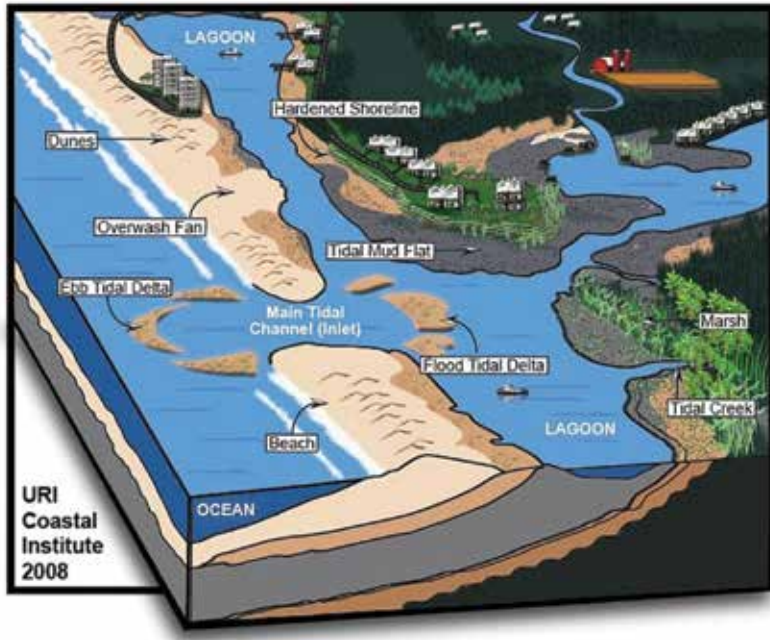
[www.ricimatechange.org](http://www.ricimatechange.org)



"Blue About Sea Level Rise" - The face of Providence could be dramatically altered by rising sea level in the 21st century.

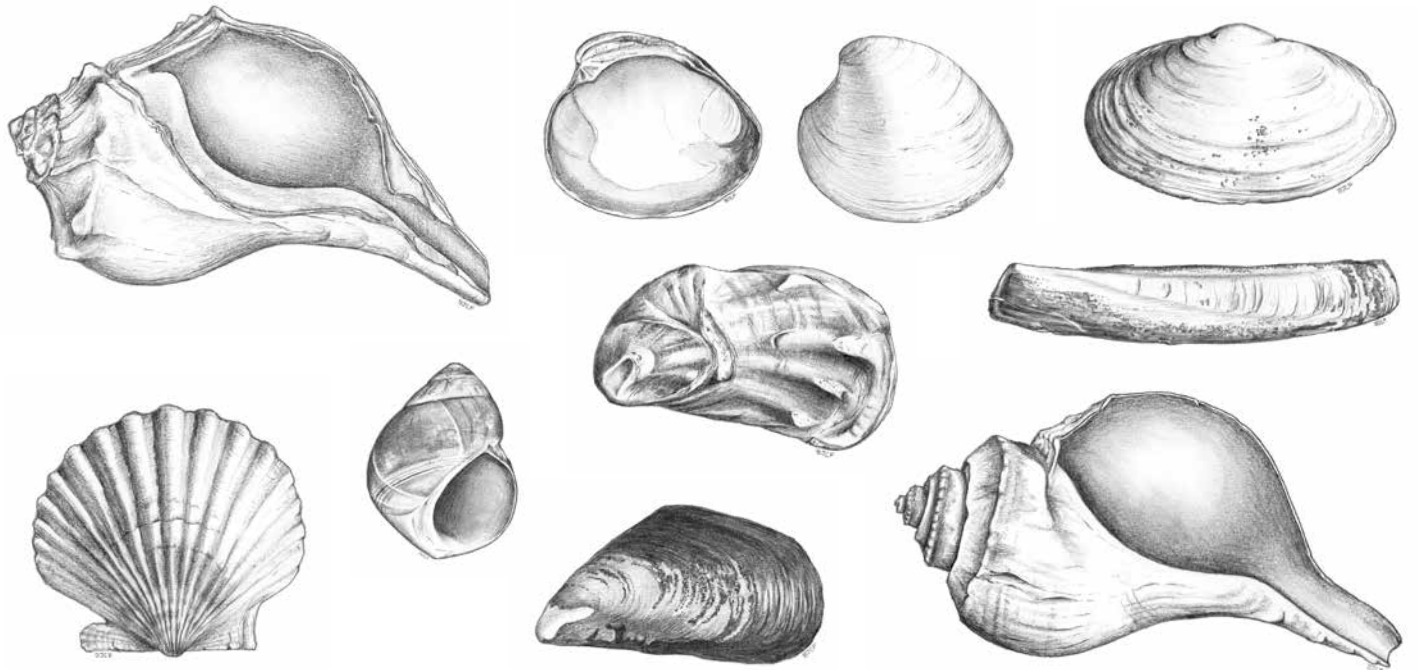


Forecast: Hot and Humid - Rising temperatures and increased rainfall will make for sticky weather problems in the future.



◀ Designer and creative producer **Nathan Dibble's** artistic rendering for journal article focused coastal ecology published by CIIP.

Artist and designer **Brandon Fuller's** illustration of the shellfish species of Rhode Island for RI Shellfish Heritage book.



The Waves of Change climate website grew out of the Climate Change Collaborative. This RISG-funded collaborative blended the work of URI's Cancer Prevention Research Center's transtheoretical model (TTM) of behavior change, CRC's community engagement skills, and the CI's communication skills to foster climate change preparedness. In 2014, the CI took over the support and maintenance of Waves of Change, which translates climate science for an audience of non-scientists in various stages of acceptance of climate change. The website, which the CI updates weekly and reviews annually for scientific accuracy, is now included as a "down to earth" resource by the Georgetown Climate Center Adaptation Clearinghouse. It has also been adopted for educational use by a number of high schools and colleges. The CI is launching a new section dedicated to small business owners and another designed specifically to appeal to millennials.

Focus groups noted that the use of humor, videos, cartoons, a slightly snarky tone, quotes from pop culture figures to founding fathers, and layered complexity in the information makes the site eminently readable. The CI continues to monitor its impact; Google Analytics data show there is ongoing and frequent use of the site in the US and internationally and read-time is 8-10 minutes, significantly higher than average website use. Going forward,



the CI supports the scientific community's call for the urgent reduction of our global carbon footprint citing that the global community is past the tipping point of climate change. Therefore, it is critical that the CI continues to provide accurate and engaging information to the general public in order to move more people toward action in response to climate change.

**CI Support:** \$40,000 development, \$5,000 annual maintenance

[www.riclimatechange.org](http://www.riclimatechange.org)

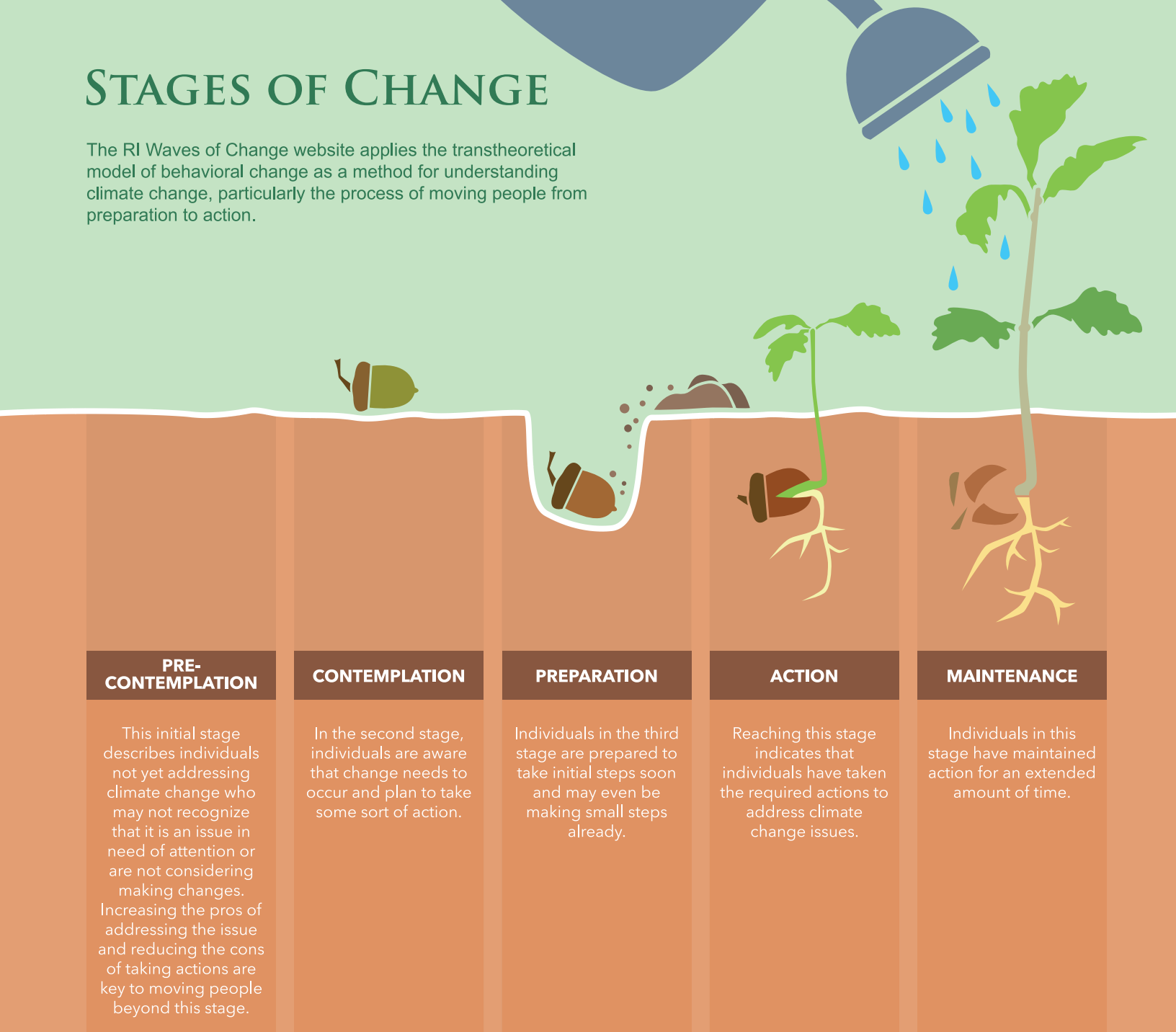


**Senator Sheldon Whitehouse (D-RI)**, a prominent champion of climate change action, serves as keynote speaker for the public launch of the RI's Climate Challenge: Waves of Change website.



# STAGES OF CHANGE

The RI Waves of Change website applies the transtheoretical model of behavioral change as a method for understanding climate change, particularly the process of moving people from preparation to action.



The Transtheoretical Model (Prochaska & DiClemente, 1983; Prochaska, DiClemente, & Norcross, 1992) is an integrative, biopsychosocial model to conceptualize the process of intentional behavior change. TTM has been adapted to illustrate its use in addressing climate change. The RI Sea Grant-Funded Climate Change Collaborative, of which Dr. Prochaska was a member, approved its application.





# NARRAGANSETT BAY WATERSHED COUNTS

ECONOMY • ENVIRONMENT • EQUITY

Together with the Narragansett Bay Estuary Program (NBEP), the CI co-coordinates Watershed Counts (WC) to report on environmental and human health in Narragansett Bay and its watershed through accessible science, using data-supported case studies and profiles of people and communities. WC grew out of a recognized need for better public information regarding the health of the Narragansett Bay watershed, and how human activities and climate change impact its health. The goal of WC is to coordinate and disseminate a cohesive message to the general public regarding linkages between environmental health and regulatory actions in the bi-state watershed rooted in scientific data and adaptive management.

Each year, the WC report focuses on a different aspect of watershed health, informing the general public of its importance to our environment, communities, and economy. In recent years, the report has focused on headwaters and the connection between marine and freshwater, urban waters, and marine and freshwater beaches.

The collaborative work of WC's broad coalition of over 70 agencies and organizations builds partnerships between the URI science community and regional organizations, creating opportunities for future collaboration, while enhancing URI's reputation for excellence.

**CI Support:** \$7,500 annual average, CI assistant director coordinates

[www.watershedcounts.org](http://www.watershedcounts.org)

Providence Police Captain Dean Isabella speaks at a press conference for the release of the annual Watershed Counts report. He is flanked by CI Assistant Director Nicole Rohr (left) and Superintendent Meghan Kisch, Blackstone River Valley National Historical Park (right).

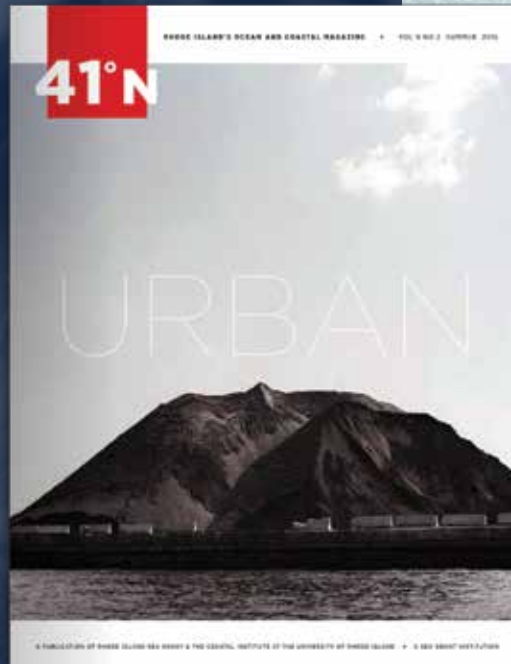


In partnership with RISG, the CI set out to revamp 41°N, which had previously served a very limited audience of researchers and practitioners. Incorporating sought-after feedback from focus groups and subscribers, 41°N now deservedly bears the masthead of RI's premier ocean and coastal magazine, with distribution to 12,000. This newly branded biannual magazine examines a range of subjects: climate change, marine commerce and recreation, ecology and habitats, ocean planning, cultural history, and the economy.

The CI and RISG now generate this publication as a vehicle for engaging people who bring a variety of interests and values to the many facets of coastal ecosystems. A distribution service and the newly launched [41Nmagazine.org](http://41Nmagazine.org) website ensure that the magazine is available to both state residents and the thousands of visitors that flock to our coastal towns, ports, marinas, and beaches.

The investment in 41°N helps Rhode Islanders, as coastal people, to understand how scientists and managers protect places of value, from ports to private residences. The return is broader community recognition of both the challenges and rewards of working together to protect and bequeath our coastal legacy.

**CI Support: \$12,500 annual average**



### The Urban Issue

Vol 9 No 2  
Summer 2016

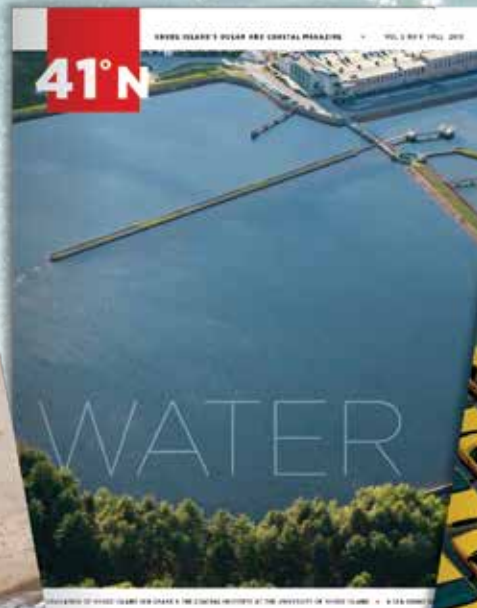
Examines issues that are unique to our urban coasts and waterways, including artificial reefs for shellfish restoration and the challenges of marina management in light of sea level rise.



### The Erosion Issue

Vol 7 No 2  
Spring/Summer 2014

Looks at coastal erosion and shellfish aquaculture in the Ocean State and presents how property owners are adapting to increasing rates of erosion.



### The Water Issue

Vol 9 No 1  
Fall 2015

Considers water in some of the many ways it permeates our lives—as supplying a fundamental need for all living things, as a conduit for international trade, as a source of refreshment and recreation, and even as the hidden essence of a millennia-old fermented beverage.



### The Resilience Issue

Vol 8 No 2  
Winter 2015

Investigates coastal resiliency in Rhode Island and elsewhere, and issues related to protecting property ranging from ports to private residences.





# BIOBLITZ: DISCOVERING NATURE'S NEIGHBORHOOD

A CI Documentary

The CI is a long-standing supporter of the Rhode Island Natural History Survey's (RINHS) Annual BioBlitz, in which scores of intergenerational citizen volunteers come together to count and identify as many species as possible within twenty-four hours on a particular parcel of land. BioBlitz highlights biodiversity and engages citizens in scientific discourse and promotes support of their local ecological communities.

In 2013, the CI brought in a professional film company and an advisory producer, both with a history of frontline Public Broadcasting Service (PBS)-funded work, to produce a CI-crafted thirty-minute broadcast-quality documentary featuring BioBlitz. The film underscores the importance of monitoring, which is viewed as tedious by the public, less than exciting by funders, and baseline critical by scientists. Citizens, scientists, and hobbyists, along with the middle and high school science superstars of tomorrow excitedly participated in the shooting of the film, which was designed to amplify the BioBlitz message and broaden its audience.

With the documentary's release, the CI leveraged the long-term efforts of RINHS's BioBlitz, making the case for a species-driven understanding of the environment and for personal connections between people and biodiversity. Following a sneak peek preview for RINHS members, many of whom are URI faculty, staff, and a regional pool of citizen scientists, the documentary is now running throughout this year on RI PBS channels for children and

adults, and will serve permanently as a BioBlitz recruiting and educational tool. The CI also distributed 400 copies to RI agency heads, decision makers, and libraries, promoting the importance of an environmentally educated citizenry and of fostering biodiversity in RI. This documentary is an enjoyable commercial for environmental monitoring—an investment that will pay off in generational dividends as an educational tool to produce voters who understand the value of supporting such efforts.

**CI Support:** \$170,000 (production company provided 40% reduction in fees due to professional relationship)



“This video is a great tool to empower people to learn about their local environment and to recruit volunteers for the next BioBlitz.”

David Gregg, Executive Director, RINHS



## XPLORATION AWESOME PLANET

Xploration Awesome Planet, a nationally syndicated nature and environment television show geared toward teenagers, highlighted CI-supported research at the Napatree Point Conservation Area in December 2015. Despite the approach of Hurricane Joaquin, host Philippe Cousteau, Jr., grandson of pioneer oceanographer Jacques-Yves Cousteau, along with researchers from URI and other local institutions donned

their foul weather gear to discuss sediment transport on barrier dunes and migratory bird tracking using the latest technology with telemetry towers and time-tested nanotags.

Thanks to the joint efforts of CI Senior Fellows along with early-career researchers, local CI-affiliated work was highlighted on a national level transporting children and teens from their



Philippe Cousteau, Jr. interviewing Dr. Peter Paton about migratory shorebirds.

homes across the country to this unique coastal ecosystem in our state. This externally funded, low-cost, high-return CI investment is evidence to potential funders of the important work of the CI, Watch Hill Conservancy Area, Watch Hill Fire District, and other partners.

**CI Support: \$700**

[hulu.com/xploration-awesome-planet](https://www.hulu.com/xploration-awesome-planet)



# COMMUNICATING SCIENCE: A PRIMER WITH APPLICATIONS

“Science communication” is frequently generated to serve the amorphously defined general public, which is far too one-size-fits-all. The reality is that crafting effective messages around the most pressing environmental threats is a difficult and complex task that requires targeted and nuanced messages. To provide a range of perspectives and different approaches, the CI developed *Communicating Science: a primer with applications*. Select authors, including Sunshine Menezes, Executive

Director of the Metcalf Institute for Marine & Environmental Reporting, Arnie Reisman, formerly of WGBH and Boston’s Channel 6, and Chip Young, an RI treasure on all matters media, provide guidance and best practices to clearly and concisely craft efficacious coastal science information. This resource has a special focus on assisting managers and others to effectively reach the media and decision makers, two critical audiences with distinct informational needs. Effective

communication is crucial to building relationships and attracting financial support from those decision makers who are looking to invest in coastal management strategies, whether for the benefit of RI or on a global scale. The CI is committed to the premise that return on investment begins with top-notch communication.

CI Support: \$4,964

[www.ci.uri.edu/publications](http://www.ci.uri.edu/publications)



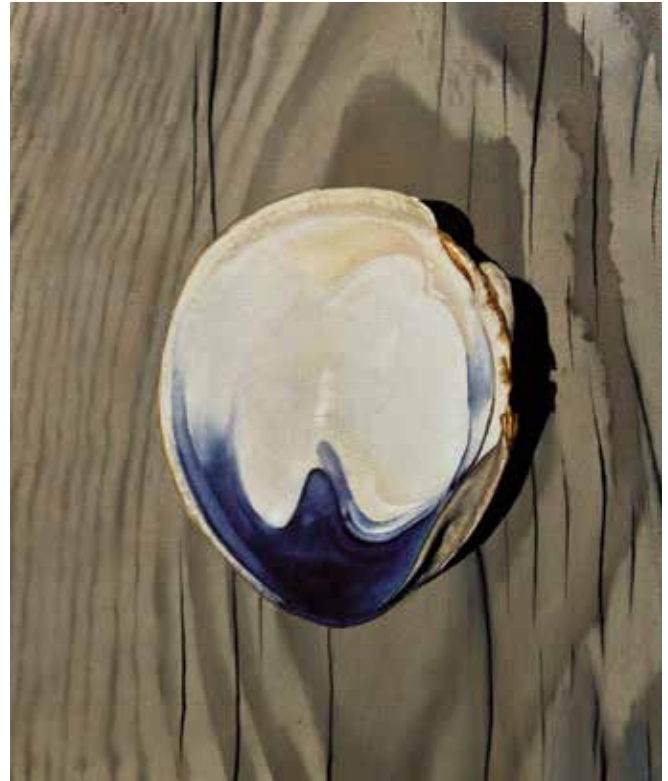


a multimedia  
coastal and ocean  
learning commons

Working in partnership with the URI GSO, the CI developed a multimedia coastal and ocean learning commons hosted at the Bay Campus, where scientists share ideas or species images with artists who interpret and transform them into visual or digital art products.

Studio Blue has supported student exhibits, gallery openings, and fundraisers in support of student scholarships. Prominent artists have displayed their work on marine and coastal subjects as a way to enhance emotional learning, a right-brain activity that increases information “stickiness” and holistic learning regarding associated science topics. The CI has purchased art for permanent display at a highly reduced price and commissioned artists for works that introduce complex science. Two of these works have appeared as covers on 41°N and are permanently displayed in the studio. Partners include GSO, the URI Department of Art, and the RI Experimental Program to Stimulate Competitive Research (EPSCoR). In addition, the visual richness of the space enhances the experience of hundreds of visiting guests year-round.

**CI Support:** Professional artists have donated or provided works at highly discounted rates; student work is on permanent loan



**Eric Lutes** is an actor and artist originally from Charlestown, RI. After years of work in show business in plays, commercials, television, and indie films, Lutes returned to his first love of drawing and painting. The marine-based focus of his art was inspired by his time on the beach and exploring Ninigret Pond. Lutes’s work can be seen at the Charlestown Art Gallery in Charlestown, RI.

[www.ericlutesart.com](http://www.ericlutesart.com)

**Aron Belka** is a painter currently living and working in New Orleans. His work embraces a wide range from the wetlands of Louisiana to the vibrant life of New Orleans to the culture of Sierra Leone. Belka’s work is included in numerous private and public collections, including a recent acquisition by the New Orleans Jazz and Heritage Foundation.

[www.aronbelka.com](http://www.aronbelka.com)



APON  
2012

# CI PRODUCTS: ART, THEATRE AND FILM



BUY THE BAY:  
COASTAL LIFE IN  
THE GILDED AGE



A COASTAL  
CABARET

THE NOLA PROJECT



Prof. Judith Swift, URI,  
Communication Studies and  
Director, URI Coastal Institute

Th, October 28, 2010

5:00 - 6:30  
Lippitt Hall, Room 401

"If It Wasn't for Bad Luck I Wouldn't  
Have No Luck At All: Katrina, BP,  
and a Tale of Trouble"

New Orleans is our European city where the love of art and food center around a culture so unique it takes your breath away. Travel from there down the Delta to bayou country where Cajun fiddlin' meets bottleneck guitar. The contrasts are stunning: iron lace verandas, lush Spanish moss, bellowing gators and a jeweled string of wetlands that are melting away as fast as cotton candy on a kid's tongue. From NOLA to the Gulf, this treasure has been pilfered for centuries. In the words of Louisiana's people, we'll hear the echoes of despair cloaked in a spirit of joyful determination.



ts are free and open to the public. For questions, up-to-date information, and directions, please visit :  
<http://www.uri.edu/activities/>

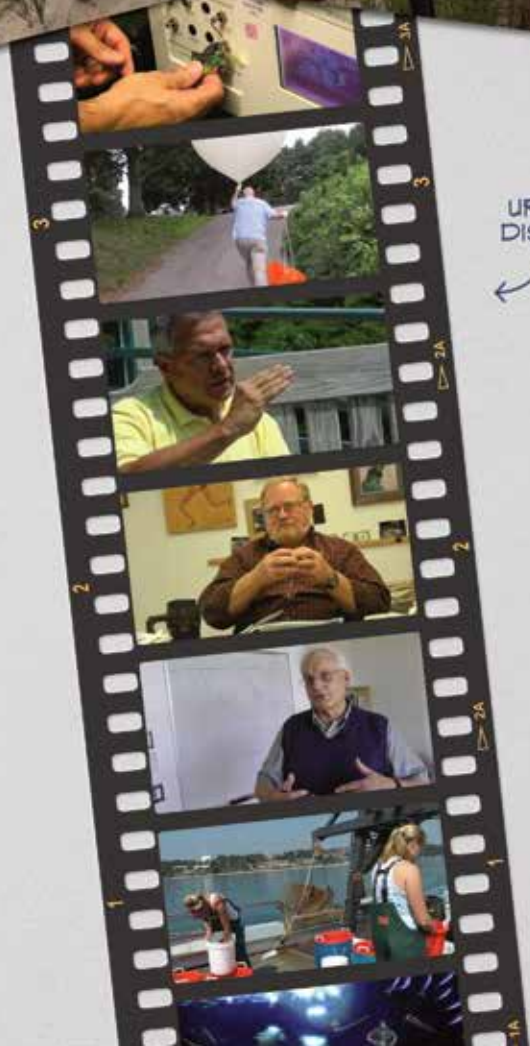
NAPATREE VIDEO  
IN DEVELOPMENT



CLIMATE ACTION  
VIDEOS

URI RESEARCHER  
DISCUSSION SERIES

SHELLFISH MANAGEMENT  
PLAN SUMMARY VIDEO



Watch videos at [www.youtube.com/user/CoastURI/videos](http://www.youtube.com/user/CoastURI/videos)



Section 5:

# CREATING TRANSPARENCY IN A NEUTRAL VENUE

The CI chairs the RI Environmental Monitoring Collaborative (RIEMC), partnering with vice chairs from the RIDEM and the Narragansett Bay Commission. The RIEMC was created by RIGL § 46-31-9 to engage ~20 contributing members in the development and implementation of a statewide strategy for environmental monitoring. The whole of RIEMC represents state and federal agencies, nongovernmental organizations, and the academic community.

The RIEMC produces an annual report to inform decision makers in the RI

General Assembly and the governor on the importance of environmental monitoring, the status and trends of 21 monitoring priorities, e.g., water quality, salt marshes, shellfish growing areas, etc., and the fiscal status of these critically important programs. To ensure RIEMC transparency and increase accessibility of data and its interpretation, a new website is being developed with funding provided by an EPA Southeast New England Program Healthy Communities Grant to RIDEM and subcontracted to the CI.

In addition to the CI statutory obligation, overseeing the RIEMC is in keeping with the CI's mandate to serve as a neutral venue for dissemination of unbiased data, which the State uses to inform budgetary decision-making.

**CI Support:** \$500 annual average, CI assistant director's time. **Additional Support:** \$5,000 annual average RI Department of Administration

[www.rimonitoring.org](http://www.rimonitoring.org)



# SOUTHERN NEW ENGLAND RECREATIONAL FISHING SYMPOSIUM

On a biannual basis, the CI joins with the RI Saltwater Anglers Foundation to sponsor a daylong symposium, also supported by the global research organization, the Pew Charitable Trusts. Among the attendees are fishing enthusiasts, fish and wildlife regulators, chambers of commerce and other tourism entities, as well as scientists whose research focuses on fisheries management and stock assessment. The symposium facilitates conversations among a diverse group of stakeholders on the management

of recreational fisheries in southern New England and their contribution to local and state economies. By bringing together parties that historically have conflicting interests, the CI helps build consensus regarding fisheries regulations that leads to increased compliance and optimal use of fish stocks for peak economic return that benefits the fishermen, the state, and preserves the resource.

**CI Support:** \$2,250 average per symposium

## CONFLICT RESOLUTION

Given its role as a neutral venue, the CI frequently hosts panels, workshops, symposia and speakers that hold contrasting opinions. By facilitating these events with external—and therefore distant from the outcome—facilitators, the CI has become a go-to site for the rational discussion of contentious public issues, e.g., stormwater management, water quality management, NGO staff and board duties and oversight, fisheries management, etc. In addition, the CI director offers pro bono conflict resolution and

facilitation on a confidential basis, a service that is requested on an average of six times annually. Facilitation sessions include municipalities, state agencies, conservancy organizations, and commercial fisheries. The value of this service is to ensure that both parties are heard and conflicts are addressed in a civil and conciliatory manner, thereby fostering common ground for a solution in service of stakeholders.

**CI Support:** CI director's time









Section 6:

# INVESTING IN THE NEXT GENERATION

# INSTITUTIONALIZATION OF INTERDISCIPLINARY TRAINING

A hallmark project was the CI Intergrative Graduate Education Research Traineeship (IGERT) Program, or CIIP, a competitive five-year, \$3.2M National Science Foundation (NSF) grant awarded in 2005. Through this program, CIIP promoted interdisciplinary graduate education for coastal and estuarine science for 24 doctoral students from a range of URI programs. These students now work in academia, government, and NGOs around the world.

Since the completion of CIIP, without fail, each alumnus/a has credited the unique interdisciplinary skills they honed through CIIP as influencing their career path and making them more aware of the social and economic—in addition to environmental—implications of coastal science and management decisions in RI, the region, the nation, and coastal zones around the world.

Interdisciplinary lessons gleaned from CIIP have influenced graduate curricula and subsequent grant proposals at URI. CIIP faculty attest that lessons learned improved the structure and pedagogy of individual graduate courses. On a curricular development scale, adoption of CIIP's consistent use of white paper requirements and internship opportunities now forms the basis of the Masters in Environmental Science and Management (MESM) program. MESM is co-coordinated by former CI Director

and CIIP PI Peter August and CIIP co-PI Art Gold, both of whom are CI Senior Fellows.

CIIP continues to provide advice on models for interdisciplinary graduate education: two CI Senior Fellows have used CIIP as a successful model to apply for an NSF Research Traineeship Grant and to develop a \$19M interdisciplinary and multi-institutional National Institute for Environmental Health Sciences proposal focused on emerging contaminants.

The CI's initial investment in CIIP paid off in the support of doctoral students,

engagement of undergraduates in research teams, expansion of faculty understanding of interdisciplinary instruction, and development of a nation-wide network of collaborators served by the CIIP students with the support of their advisors. The biggest ROI is ongoing with the development of curricular models and programs that reflect lessons learned in CIIP, the continued relationships with local and national partners, and the iterative impact on the design of future grants with a curricular component.

**CI Support:** \$3,295 for meeting for 10-year CIIP assessment, staff time

*“In great part due to the inspiration from the Coastal Institute IGERT, a team of faculty from URI is developing an interdisciplinary program in Data Science that builds upon the T-competency model successfully used by the CIIP. This philosophy was successfully implemented for graduate education, placing added value on team approaches to solve complex problems, by creating new training experiences and cross-disciplinary courses in leadership and coastal management that have been successfully incorporated into URI's graduate programs.”*

Marta Gomez-Chiarri, URI CELS

# THE GLOBAL MARINE INITIATIVE FELLOWSHIP

The Nature Conservancy (TNC) and the CI annually award a Global Marine Initiative Fellowship to a URI graduate student through a competitive process. This funding supports scholarly research in ocean and estuarine science and policy, resulting in tangible products used to advance the state of knowledge in a specific topic area. The focus of this year's solicitation was restoration and conservation of marine and coastal ecosystems, as well as the spatial extent and quantification of ecosystem services provided by existing and restored marine and coastal habitats. 2016 funding was awarded to a URI Master's degree candidate in Biological and Environmental Sciences.

**CI Support: \$12,000 annually**



“It has been a great experience collaborating and learning from the variety of scientists and experts who contribute to Rhode Island’s oyster aquaculture efforts.”

Chelsea Duball, 2016 TNC-CI Global Marine Initiative Fellow

## URI MESM AND BIMI EDUCATION OPPORTUNITIES

The Block Island Maritime Institute (BIMI), the URI MESM program, and the CI partner to employ two students (BIMI-CI Fellows) to take a leadership role in developing new educational programs for BIMI and administering a summer-long education and outreach program for children and visitors to the BIMI center on Great Salt Pond.

Two candidates are selected and mentored in the spring semester under the tutelage of CI and MESM staff, faculty, and students. The Coastal

Institute provides a 10-hour per week stipend for the Spring semester. The BIMI-CI Fellows then reside on Block Island during the summer to deliver educational programs. The benefit of the CI investment is threefold: meeting the need for educating the general public of all ages; mentoring graduate students in curriculum development; and providing an overview of career opportunities for an applied graduate degree.

**CI Support: \$3,191**

### Partners:



“Whether watching an adult laugh as a scallop swam away from a sea star; observing a teenager from the inner-city touch a fish for the first time; or simply seeing a child staring in amazement at the squid as they swam across the touch tank, this experience highlighted the importance of learning through experience and the benefits of providing lessons that are fun and exciting for participants. It is an experience that will continue to influence my career in the future.”

Valerie Preler, 2016 BIMI-CI Fellow



# COASTAL INSTITUTE GRADUATE AND UNDERGRADUATE INTERNSHIPS

Nate Merrill

Nate worked with the CI to compile information on how climate change uniquely impacts small businesses in RI. This information will soon be viewed on the Waves of Change website.



Nate recently completed his Ph.D. in ENRE and stayed local as a post-doctoral researcher with the EPA-AED, a CI partner, focusing on environmental valuation of Narragansett Bay resources.

Terri Breedon

Terri was supported for two years by the RIEMC a statutory responsibility of the CI, to work with committee members to compile the annual report.



She completed the MESM program and now applies her interdisciplinary skills to international conservation as the project director for the Gunung Palung Orangutan Conservation Program in West Kalimantan, Indonesia.

## Jarret Katz

Jarret Katz was employed by the CI while a MESM student to work on green infrastructure materials for the director of RIDEM. His time with the CI allowed him to develop a wealth of organizational skills that complemented his studies. He was recently appointed as principal planner of the City of Woonsocket.



## Tara Franey

Tara Franey, JD, is currently a MESM student gaining expertise in hydrology. Tara is working on the development of an environmental monitoring website for the RIEMC.



The CI functions as a broker to provide both graduates and undergraduates with bridge opportunities that open pathways to explore further studies and degrees, career direction, funding support, and work experience on self-contained projects that demand rigor but allow innovation and provide students with work experience to foster professional

connections that benefit them as they transition to full-time professionals. When they leave the CI, they are prepared to work in interdisciplinary teams, have a broader perspective than their degree program alone allowed, and have recommendations that speak to their work ethic, productivity, and academic achievement.

**CI Support:** All students are supported at the URI-approved graduate and undergraduate rates

“I learned how important it is to not only conduct research for conservation but also to be able to effectively communicate your information outside of the scientific world.”

Teresa Schwemmer



## Teresa Schwemmer

Teresa Schwemmer worked for the CI for several years learning practical skills that would be transferable to any future career ranging from science communication to event coordination to climate change research. After earning her B.S. in marine biology, Teresa is now a doctoral student at Stony Brook University on Long Island, New York.

## Jasper Romero

Jasper Romero came to the CI through an honors class with the director where his enthusiasm for natural systems and work ethic led to an internship with the Napatree Conservancy Area, a CI Climate Response Demonstration Site focused on studies of natural resilience.



Jasper's work with a botanist through our partner, the RINHS, and on horseshoe crab spawning with a URI CELS professor led to potential career targets and exploration of graduate school options.



## Theresa Murphy

Theresa Murphy was an Honors student who wanted to engage in conservation fieldwork. The CI arranged an internship for her and she wrote a white paper that was much heralded by NPS park supervisors: *The Herring River Estuary: Understanding Salt Marsh Restoration and How to Predict the Response of *Phragmites australis* to Increased Tidal Flow.* This work was critical in her receipt of a Udall Scholarship.



Theresa is now a graduate student conducting invasive species research at the University of Massachusetts, a topic from her internship that captured her interest.

## Aislyne Calianos

Aislyne Calianos is a Marine Affairs & Spanish major in her junior year. Aislyne works on numerous activities that support outreach and education at the CI, including event organization, topic specific research, writing for social media, and crafting messages geared to millennials about climate change. Aislyne brings the CI much needed youthful perspectives and informs our approach to her generation.



“The CI has exposed me to a range of scientific and community outreach work, which inspires me to think about the kind of work that I want to do after graduating.”

Aislyne Calianos



Section 7:

# SUPPORTING PROPOSAL DEVELOPMENT

The CI is leveraging personnel and support for the interdisciplinary grant, the National Endowment for the Humanities (NEH) Next Generation Humanities PhD Planning Grant. The project, titled “Humanities at Large,” was recently received by URI’s Department of English, under Principal Investigator (PI) Dr. Kathleen Davis. In the spirit of the NSF IGERT grant, this project initiates an exploration of options for humanities PhDs to develop interdisciplinary skills for a multitude of careers. Cross-disciplinary and experiential learning will focus on five key areas: coastal environment, health and medicine, publishing and editing, digital humanities and big data, and cultural organizations. The CI is supporting a Graduate Fellowship for this project to employ humanities skills and knowledge in service to coastal projects in the practice of conservation,

*“The Coastal Institute’s pledge to invest \$16,000 in a Coastal Studies Fellowship was crucial to URI’s successful application for a National Endowment for the Humanities ‘Next Generation Humanities PhD’ Planning Grant. In preparing submission of a full proposal, this Fellowship will serve as concrete evidence of the value of interdisciplinary partnerships.”*

Kathleen Davis, PhD, PI, Dept of English

public outreach, and environmental justice. This investment serves to broaden the reach of CI activities beyond more traditional natural and social sciences by adding the voices of a range of disciplinary perspectives.

**CI Support:** \$16,000 graduate fellowship



## Molly Volanth Hall

Molly Volanth Hall, a PhD student in English, is currently working as an NEH CI Fellow. Her charge is to expand public engagement with CI initiatives, helping to craft science communication for CI outreach, educational websites,

and social media. Working with the CI gives her the opportunity to become versed in scientific discourse, practice science communication skills, and explore ways the humanities can enhance the coastal sciences. The

investment in this graduate student fellowship will serve as a model to leverage funding from the upcoming full NEH Next Generation proposal.

# EPA HEALTHY COMMUNITIES GRANT

In partnership with the CI, RIDEM recently received a two-year EPA grant for \$200,000. This funding enabled the DEM to subcontract the CI to make use of previously collected long-term environmental data that should provide an understanding of the impacts of climate change on the upper Narragansett Bay area. The CI and RI DEM will coordinate with NBEP's Science Advisory Committee to ensure efforts by these organizations complement each other and build upon the best available data.

The CI is also funded to redesign the RIEMC website, making essential environmental monitoring information and data more accessible. When the website launches in 2017, an outreach campaign will target the general public and state decision makers to make them aware of this resource. Providing this access will enhance understanding of the need to close data gaps for improved management decisions. Users will be able to easily navigate to monitoring data, view current federal and state budgets for these monitoring priorities, and understand how monitoring data can be applied to make better informed decisions.

**CI support:** CI assistant director oversight partially underwritten by grant, CI researcher support for large data analysis



## DEPARTMENT OF HOMELAND SECURITY COASTAL RESILIENCE LEAD CENTER OF EXCELLENCE

When GSO, CELS and URI Arts & Science faculty decided to pursue the designation of URI as a Department of Homeland Security (DHS) Coastal Resilience Lead Center of Excellence, the CI provided support for grant development in multiple ways:

- » Identified and supported an external consultant who had worked for the undersecretary of DHS on hazard mitigation plans in California and independently through Harvard's Belfer Center at the Kennedy School of Government;
- » Served on the Red Team for grant review;
- » Funded a communications upgrade to the Large Conference Room in the Bay Campus CI to meet professional

standards in preparation for the site visit;

- » Provided communication training to faculty and staff in preparation for their presentations during the site visit;
- » Purchased two significantly discounted oceanscapes to enhance the professional and well-funded appearance of the conference room.

URI was not awarded the overall Center of Excellence but was awarded funding for three distinct components, a tremendous achievement for a first round entry into a highly competitive grant cycle. The CI's investment was instrumental in the DHS projected total award of \$2.6M to GSO, CELS, and A&S.

**CI Support:** \$17,689

# NATIONAL INSTITUTE OF ENVIRONMENTAL HEALTH SCIENCES

In addition to supporting and enhancing the development of interdisciplinary grant proposals, the CI also serves as co-PIs and senior personnel on proposals that fall within the expertise of the CI staff. The most recent example is a pending \$19M grant proposal with the National Institute of Environmental Health Sciences (NIEHS), led by CI Senior Fellow and GSO faculty Rainer Lohmann, and supported by an interdisciplinary team of researchers from URI, the Harvard School of Public Health, and Silent Spring Institute.

If funded, the proposed work will address the problem of emerging and expanding poly- and perfluorinated alkyl substances (PFASs) contamination by investigating human health impacts and environmental fate and transport. The proposal, titled Sources, Transport, Exposure and Effects of PFASs (STEEP), will include an interdisciplinary graduate training program,

modeled after CIIP, to be integrated at all levels from research to application and to guide the next generation of emerging contaminant researchers.

In keeping with NIEHS standards, results will be translated for a wide range of audiences, and researchers will engage with Cape Cod communities adjacent to the Barnstable Municipal Airport and Otis Air Force Base. These communities currently face the challenge of PFAS removal from drinking water because such contaminants are frequently found in ground-water plumes surrounding firefighting training sites and airports.

This research will address a pressing public health need on Cape Cod; moreover, similar concerns are ubiquitous across the US. In fact, PFAS gained national attention in early 2016 when contaminated water was found in Hoosick Falls, New York and, shortly

following that, in the exclusive tourism hotspot of North Bennington, Vermont. International communities also face the challenge of exposure to high levels of PFAS, including the Faroe Islands where the epidemiological study for this grant will be conducted. The CI not only joined this team as part of the grant personnel, but also supported grant development with extensive editing, and provided funding for graphics, logos, supplies, and daylong meetings with Harvard and Silent Spring Institute colleagues. The CI's comparatively small but smart investment in visual design, team lunches, two intense months of staff time, and overall commitment of two and a half years is well worthwhile for a potential return of \$19M to address a compelling human and environmental health issue.

**CI Support:** CI staff time

“The support of the Coastal Institute was a key factor in developing a highly competitive, multi-million dollar NIEHS proposal focused on emerging contaminants.”

Rainer Lohmann, Chemical Oceanography, GSO

# SELECTED CI ACTIVITIES (2014-2016)

Year	Season	Role	Title
2014	Spring	coordinated & sponsored	Workshop, Scientific Computing and Programming for Coastal Resource Management. Partner: EPA-Atlantic Ecology Division.
2014	Spring	coordinated & sponsored	Public meeting, Magnuson-Stevens Act Reauthorization. Partner: RI Congressional Delegation.
2014	Spring	coordinated & sponsored	Press Conference, Launch of RIClimateChange.org. Keynote: Senator Sheldon Whitehouse (D-RI). Partner: Coastal Resources Center, RI Sea Grant.
2014	Spring	coordinated & sponsored	Lecture, 2nd Annual Nixon Lecture: The Scott Nixon Effect on the Analysis of Tropical Ecosystems: from Parking Lots to Rainforests. Speaker: Dr. Ariel Lugo, International Institute of Tropical Forestry, USDA United States Forest Service, Puerto Rico.
2014	Spring	coordinated & sponsored	Workshop, Use of GIS in Disaster Planning and Response, application range for RI Emergency Management Agency. Location: Cranston, RI.
2014	Spring	presented	Presentation, RI's Climate Challenge: Waves of Change. Partner: Climate Change Collaborative. Audience: RIEC4. Location: RI Statehouse.
2014	Spring	coordinated & hosted	New England Study Tour, Chile-U.S. Marine and Terrestrial Protected Area Collaboration. Partner: NPS.
2014	Summer	attended & presented	National Meeting, CESU Annual Meeting. Location: Washington, DC.
2014	Summer	sponsored & participated	Site Visit, DHS Coastal Resiliency Center Grant Proposal. Host: GSO, proposal PI.
2014	Summer	sponsored	Lecture Series, Wood-Pawcatuck Watershed Association: Climate Change Lecture Series. Location: Chariho Middle School.
2014	Fall	facilitated (3 sessions)	Newport Water Supply TMDL Technical Advisory Committee. Host: City of Newport. Partner: RIDEM. Location: Newport, RI.
2014	Fall	presented	Lecture, Responsible Conduct of Research Training: Collaborative Science. Host: Division of Research and Economic Development.
2015	Spring	sponsored	Meeting, Southern New England Saltwater Fishing Symposium. Partners: Saltwater Anglers, Pew Charitable Trusts. Location: Warwick, RI.
2015	Spring	coordinated & sponsored	Lecture, 3rd Annual Nixon Lecture: Nitrogen: The Good, The Bad, and The Beautiful. Speaker: Dr. Sybil Seitzinger, Royal Swedish Academy of Sciences, Stockholm, Sweden.
2015	Summer	presented	Panelist, Voices for the Coast. Host: Brown University.
2015	Summer	coordinated & sponsored	Public Event, BioBlitz: Discovering Nature's Neighborhood. Partner: RINHS. Location: RI Public Television.
2015	Summer	sponsored	Workshop, EPA-CHRP, Modeling/Hypoxia. Host: GSO.
2015	Summer	coordinated & sponsored	Event, Ten-Year CIIP Reunion: Review of Program Value in Career Development. Location: Wood River Watershed.
2015	Summer	sponsored & coordinated	National Meeting, EPA-Office of Research and Development Tools Café. Partner: EPA ORD.
2015	Fall	sponsored	Meeting, RI Environmental Sensitivity Index (ESI). Partner: NOAA.

Year	Season	Role	Title
2015	Fall	sponsored	Meeting, Napatree Point Conservation Area/National Park Service: Improvements to Signage. Host: Watch Hill Fire District and Watch Hill Conservancy.
2015	Fall	presented	Invited Lecture, Managing for the Present, Preparing for the Future: personal journey to professional application. Location: Armstrong State University, Savannah, GA.
2015	Fall	facilitated	Meeting, New England Land Trust Board. Location: Matunuck, RI.
2016	Spring	sponsored	Workshop, Two-Day Data Bootcamp. Host: RhodyRStats.
2016	Spring	coordinated & sponsored	Public Lecture, Past, Present, and Future of Rhode Island's Quahog Industry. Partner: RI Sea Grant. Location: Providence, RI.
2016	Spring	presented	Invited Lecture, Window of Opportunity: What People are Willing to Do Post Disaster. Host: Louisiana Sea Grant Marine Extension. Location: Baton Rouge, LA.
2016	Spring	presented	Invited Lecture, Living on the Edge: Interdisciplinary Approaches to Coastal Management. Host: Louisiana State University Coastal Sustainability Studio. Location: Baton Rouge, LA.
2016	Spring	presented	Workshop, Leadership: The Challenge of Leading and the Value of Following, Workshop for graduate students in Coastal Science, Engineering, and Architecture, LSU. Host: Louisiana State University Coastal Sustainability Studio. Location: Baton Rouge, LA.
2016	Spring	presented	Invited Lecture, Fear and Loathing in Science Communication: How Broadway May Save You, Workshop for graduate students in Coastal Science, Engineering, and Architecture, LSU. Host: Louisiana State University Coastal Sustainability Studio. Location: Baton Rouge, LA.
2016	Spring	coordinated & sponsored	Lecture, 4th Annual Scott W. Nixon Lecture: Getting Rid of Hypoxia in a Warming World. Speaker: Dr. Daniel Conley, Lund University, Sweden.
2016	Spring	sponsored	Workshop, NOAA Emergency Response Division's Shoreline Cleanup and Assessment Technique (SCAT) Training. Partner: NOAA.
2016	Spring	sponsored	Public Lecture, Woven in Time: The Narragansett Salt Pond Preserve Documentary and Discussion with Filmmaker. Speaker: Mark Leavitt.
2016	Summer	attended & presented	National Meeting, CESU Annual Meeting. Location: Shepherdstown, WV.
2016	Summer	coordinated & presented	Workshop, GSO Graduate Student Workshop in Science Communication.
2016	Summer	coordinated & sponsored	Workshop, 2016 Scientific Support for Environmental Emergency Response (SSEER) Summer Workshop. Partner: RIDEM, NOAA.
2016	Summer	sponsored	Workshop, Joint RIGIS User Group Event: Introduction to Aerial and Satellite Images of Rhode Island. Host: URI Environmental Data Center.
2016	Summer	coordinated & sponsored	Workshop, Two-Day Data Carpentry Workshop. Partner: RhodyRStats.
2016	Fall	sponsored	Conference, New England Estuarine Research Society Annual Conference. Location: Block Island, RI.
2016	Fall	coordinated & sponsored	Public Lecture, Illustrating Science. Speaker: Author & Illustrator David Macaulay.
2016	Fall	presented	Conference, Restore America's Estuaries Biannual Summit. Location: New Orleans, LA.



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