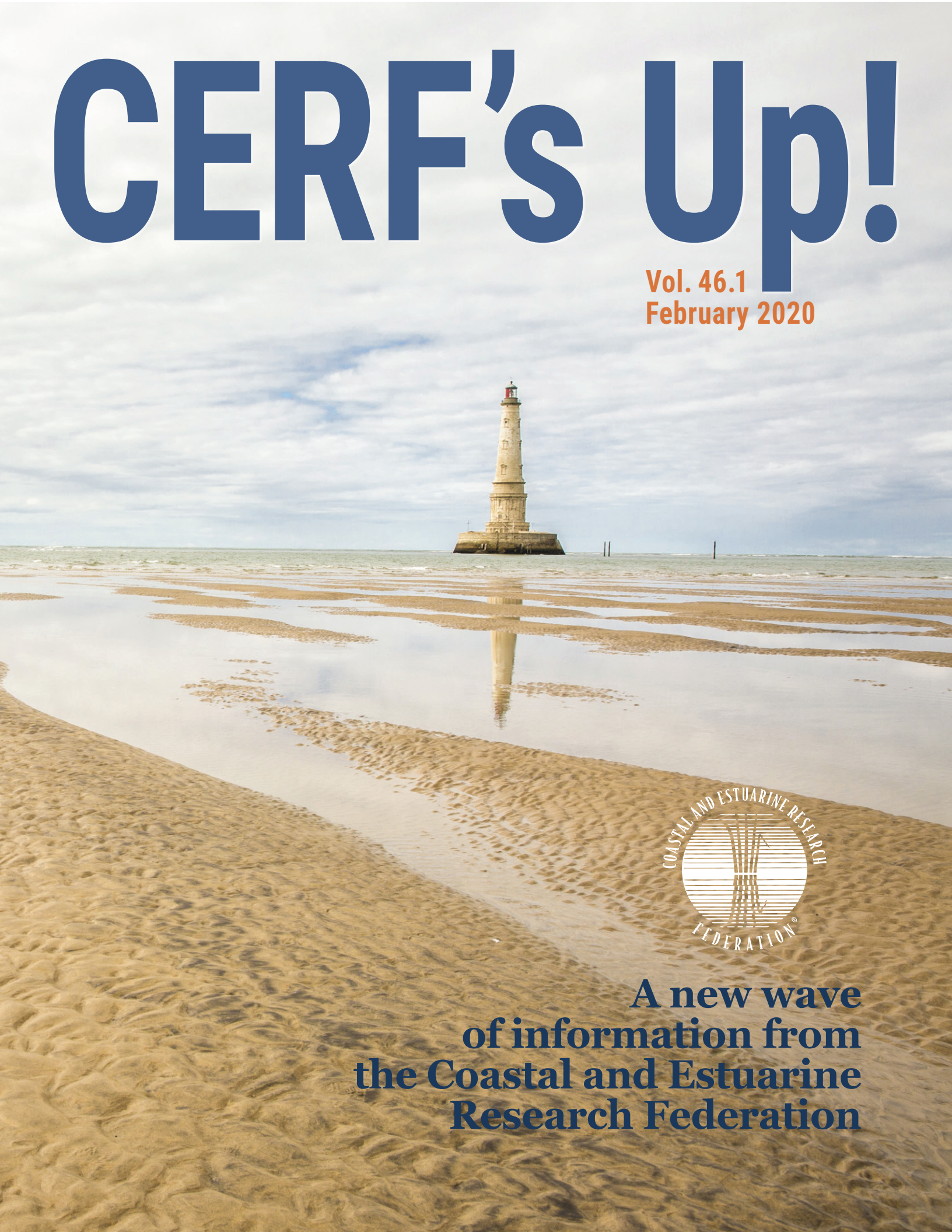
CERF's Up!

Vol. 46.1
February 2020



A new wave of information from the Coastal and Estuarine Research Federation

CERF's Up!

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Tour of R/V Point Sur

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Message from the President

Jim Fourqurean

I had a blast at CERF 2019[1] in Mobile, Alabama, and I hope that you did too! It is hard to believe that a month has already flown past since our Federation's 25th biennial conference. CERF meetings are unique gatherings of estuarine professionals that include all aspects of science, stewardship and restoration of our coastal environment: from environmental consultants, to environmental managers, to government agency scientists and academicians at all stages of their careers. This unique group places a great deal of emphasis on communicating great science, best practices for management, professional development, social networking, and having fun when we come together once every two years. The meeting was a huge success, with 1406 registrants from 26 countries. The great success of the meeting was a product of the hard work of literally hundreds of volunteers who helped plan, manage and execute the meeting.

The meeting marked the biennial rotation of CERF leadership, with the last meeting of the 2017-2019 Governing Board and the inaugural meeting of the 2019-2021 Board[2]. I am honored to have been elected president of CERF for 2019-2021. Past Presidents and Governing Boards have done a great job making sure that CERF is well-positioned as a strong voice for the importance of science and the communications between scientists and managers for the stability of coastal and estuarine systems. CERF is also on a strong fiscal foundation thanks to their work. I trust that the new Governing Board and I will continue to help guide and grow CERF over the next two years.

In particular, I am indebted to the former past-president, Robert Twilley, for leading the development of CERF's strategic plan, Visions IV, and to current past-president Hilary Neckles for leading the charge on the implementation of that strategic plan based on a strong plan of action. The current Governing Board will work to make sure the goals set forth in Visions IV are realized. I also hope I have learned some of the leadership lessons modeled by Hilary and Robert–they will be very tough acts to follow!

I am particularly proud of the steps CERF has taken to be welcoming and supportive of all its members. The Federation values diversity in all its dimensions, and has taken concrete steps to increase the diversity of the membership. Many of those steps were advanced during the CERF 2019 meeting. I was especially impressed by the CERF Inclusion Lunch, a part of the CERF initiative "Rising TIDES: Toward an Inclusive, Diverse, and Enriched Society". The luncheon was standing room only, reflecting the enthusiasm for the program from across the diversity of CERF members. This was also the first CERF meeting to follow an explicit Code of Conduct for conference attendees. You will find a brief report of our efforts to live up to the Code of Conduct in this edition of *CERF's Up!*

I hope to help keep the new Governing Board looking towards the future and the new changes to our social and professional environment that will likely change the way we do business as a Federation. I expect some of these new challenges to be changing science publication models, the rise of virtual meetings, and an environment where all information is expected to be free for everyone, all the time. In such a coming world, how does CERF continue to provide value to its members? We welcome ideas from everyone in the CERF membership about how to do this. And, I encourage all members to volunteer to serve on the committees set up by this Governing Board to build value for our members.

1 https://www.cerf.science/cerf-2019
2 https://cerf.memberclicks.net/board-staff
3 https://www.cerf.science/about#vision
4 https://cerf.memberclicks.net/risingtides

Greetings from the New CERF's Up! Editors

CERF is working to make the quarterly newsletter more visible, useful, and interesting. In addition to the short articles on research topics begun a couple years ago, we are opening CERF's Up! to book reviews, results from workshops, viewpoint pieces, diagrams, illustrations, poetry, art, and cartoons. We'd like to hear from a diversity of people. We hope the newsletter will provide useful information and advice, while also conveying some of the awe and wonder of estuaries, the excitement of science, the thrill of a successful management outcome. Why do we do what we do?

Stephen Hale. I look forward to being an editor for the *CERF's Up!* newsletter. After working as a Fishery Biologist in Alaska, a Marine Research Associate at the University of Rhode Island, and a Research Ecologist at the U.S. Environmental Protection Agency laboratory in Rhode Island, I am now retired and happy for this chance to continue my long association with CERF. The photo is from the Pembrokeshire Coast Path in Wales, which I recently hiked from St. David's to St. Dogmaels. The spectacular sea cliffs, strong currents, sea birds flying by, grey seals resting in remote coves and estuaries with huge intertidal flats thanks to a tidal range up to 6-7 m would sharpen anybody's enthusiasm for nature. And regarding the place of humans in nature, I should mention cream teas in charming Welsh villages!

Allison Fitzgerald. I am excited to be an editor for *CERF's Up!* As a newer member of CERF, I am looking forward to becoming more involved in the society and meeting more amazing researchers, outreach coordinators, educators, and policy makers. We all play a vital role in keeping our estuaries and coasts beautiful for the future. A little about me: After getting my PhD (ecology), I was able to combine my love of research and education with my love for citizen science and outreach, and now work as an assistant professor at New Jersey City University. Additionally, I am an oyster restoration coordinator for NY/NJ Baykeeper, a local non-profit. I spend most of my days outside with my favorite invertebrates, not a bad day at all—even when my students decide to fool around with a spider crab.

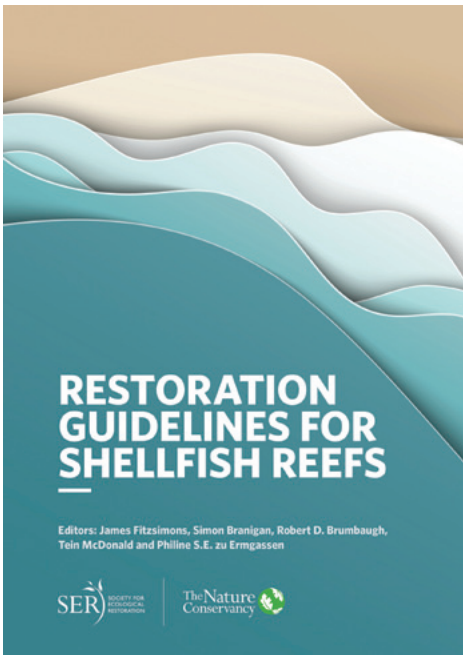
Please consider sending your estuarine story, whatever it may be, to newsletter@cerf.science. Check the revised *CERF's Up!* submission guidelines (cerf.science/cerf-s-up-contribution-information).

UPCOMING EVENTS

SEERS 2020 Spring Meeting	**19-21 March, Jekyll Island, Georgia**
AERS 2020 Spring Meeting	**26-29 March, Monmouth University, West Long Branch, New Jersey**
PERS/CAERS 2020 Joint Meeting	**2-4 April, Florence, Oregon**
ACCESS BoFEP Joint Conference 2020	**13-15 May, Dalhousie University Agricultural Campus, Truro, Nova Scotia**
NEERS 2020 Spring Meeting	**4-6 June, Salem, Massachusetts**

Updated Restoration Guidelines for Shellfish Reefs

Simon Branigan and Boze Hancock
The Nature Conservancy
Email: simon.branigan@tnc.org



Cover: Restoration Guidelines for Shellfish Reefs. The Nature Conservancy

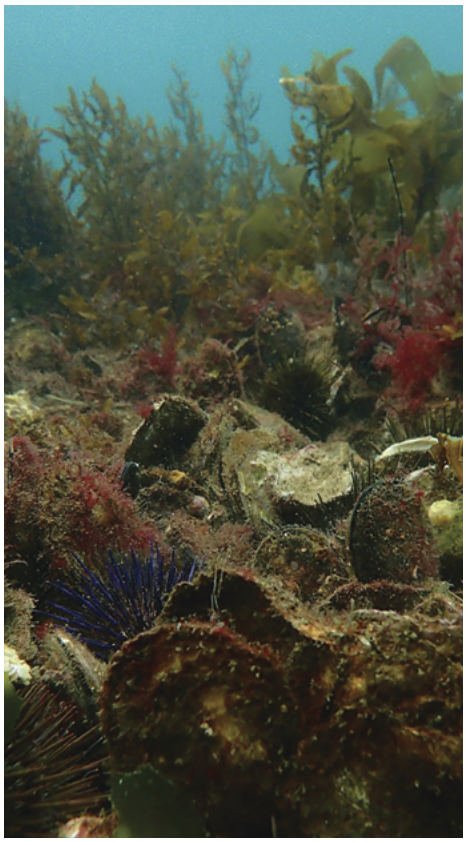
Globally, 85% of shellfish reefs have been lost, making shellfish reefs one of the most threatened marine ecosystems on the planet.[1] To support the increasing number of projects aiming to restore these ecologically significant ecosystems, The Nature Conservancy and the Society for Ecological Restoration recently published updated *Restoration Guidelines for Shellfish Reefs*.

Shellfish reef decline is mainly a result of historical overharvesting, compounded by catchment to coast sedimentation, pollution, and disease. Acknowledgment of this loss coupled with growing recognition of the valuable ecosystem services that shellfish reefs perform in coastal systems (including water filtration, denitrification, coastal protection, and finfish production) has led to a widespread and growing focus on the restoration and protection of shellfish reefs.

The first Practitioners Guide[2], published in 2006, focused primarily on supporting U.S. community-based oyster restoration. Since then, shellfish reef restoration has expanded to many other nations with projects frequently implemented at larger scales. The updated guide[3] incorporates new knowledge and provides a global perspective.

The guide's purpose is to help restoration practitioners, managers, and community members make decisions as to where and how to establish successful restoration projects. It includes examples and case studies of how the guidance can be applied in a range of different settings, loca-

Monitoring of Palmetto Plantation shellfish reef restoration site in South Carolina, USA. Photo: Joy Brown



Ostrea angasi *oyster reef, Georges Bay, Tasmania, Australia.* Photo: Chris Gillies

Deployment of Lau Fau Shan shellfish reef, Hong Kong. Photo: Kyle Obermann

tions, scales, and species. Importantly, the guide aligns shellfish reef restoration approaches with *International Principles and Standards for the Practice of Ecological Restoration*.[4]

The guide's content was informed by a global survey of practitioners and managers as well as input from several planning workshops. A checklist recommends:

• Know the system you are working in, including the ecosystem in its local setting, causes for its decline, current threats, and biology of the target bivalves.

• Develop a restoration concept and socialize it with potential project stakeholders and supporters.

• Establish a feasibility plan, including the identification of reference ecosystems or reference models and derived targets.

• Identify funding sources and secure funding, including linking ecosystem service outcomes to beneficiaries and targeted funding opportunities.

• Establish a project management system.

• Know biosecurity risks and permitting processes.

• Undertake habitat suitability assessments and pilot studies.

• Scale the project to appropriate ecological scales.

• Consider technical approaches including reef design (e.g., reconstruction vs. assisted regeneration).

• Undertake restoration, including use of community volunteers and contractors.

• Set up monitoring and evaluate and report results, including measuring progress against predefined restoration targets and reference ecosystems and models.

• Effectively communicate outcomes to stakeholders, practitioners, and the research community.

Case studies from different countries provide real life examples in different contexts. Windarra Reef in South Australia shows how development of a business case based on the economic and social benefits of restoring oyster reefs was instrumental for obtaining co-funding that is enabling restoration of 20 hectares of shellfish reefs. Practitioners in Hong Kong navigated the challenges of working in areas that support threatened species. The world's biggest shellfish reef restoration project, Harris Creek in Chesapeake Bay in the U.S., restored 142 hectares of oyster reefs between 2011 and 2015. This project showed how an assisted regeneration project (spat-on-shell planted directly onto the remnants of an existing shell reef) was combined with reconstruction techniques (a substrate base was constructed prior to seeding and planting with spat-on-shell).

The guide also highlights rapidly expanding activity around restoration of other types of habitat-building shellfish, most notably mussels. These species deliver many of the same ecosystem services as restored

oyster reefs, but they often have different life histories from oysters; hence, the restoration approach needs to be tailored to these differences to maximize the chances of success.

The web version of the new guide can be downloaded from natureaustralia.org.au/restoration-guidelines. The guide is also available in Chinese (http://www.tnc.org.cn/TNC_Restoration_Guidelines_CH_Final.pdf).

Revive Our Gulf volunteers in New Zealand shoveling Green-lipped mussels onto restoration site.

Photo: Shaun Lee

References:

1 Beck, M.W., R.D. Brumbaugh, L. Airoldi, A. Carranza, L.D. Coen, et al. 2009. Shellfish Reefs at Risk: A Global Analysis of Problems and Solutions. The Nature Conservancy, Arlington, VA, USA.

2 Brumbaugh, R.D., M.W. Beck, L.D. Coen, L. Craig, and P. Hicks. 2006. A Practitioners Guide to the Design and Monitoring of Shellfish Restoration Projects: An Ecosystem Services Approach. The Nature Conservancy, Arlington, Virginia, USA.

3 Fitzsimons, J., S. Branigan, R.D. Brumbaugh, T. McDonald, and P.S.E. zu Ermgassen. (eds.). 2019. Restoration Guidelines for Shellfish Reefs. The Nature Conservancy, Arlington VA, USA. natureaustralia.org.au/restoration-guidelines

4 Gann, G.D., T. McDonald, B. Walder, J. Aronson, C.R. Nelson, et al. 2019. International principles and standards for the practice of ecological restoration. Second edition. Restoration Ecology 27(S1), https://onlinelibrary.wiley.com/doi/10.1111/rec.13035

Using Our Best Friends to Track Sewage

Veronica M. Berounsky[1,2], Heidi Travers[3], Karen Reynolds[4] and Jonah Namzoff[1]

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[2]University of Rhode Island Graduate School of Oceanography, Narragansett, RI
[3]Rhode Island Department of Environmental Management, Providence, RI
[4]Environmental Canine Services, LLC, Otisfield, ME
Email: vmberounsky@uri.edu

Representatives from Narrow River Preservation Association, Environmental Canine Services, and The Nature Conservancy with Kai and Remi, canine detectionspecialists.

Photo: Jonah Namzoff

Karen Reynolds, K9 handler of Environmental Canine Services, gives a treat to Remi after the dog indicated human waste in a storm drain by sitting.

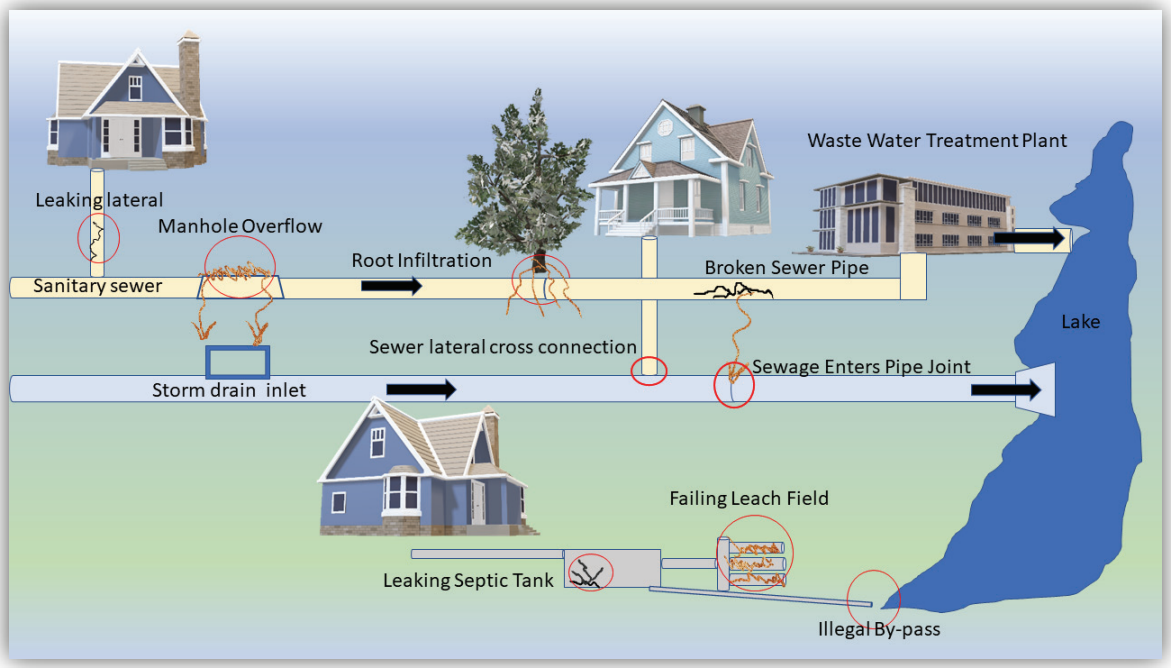
Photo: Veronica M. Berounsky

The Pettaquamscutt Estuary (Narrow River) in southern Rhode Island has been closed to shellfishing since 1994 due to high fecal coliform levels, a common problem in many coastal water bodies. Identifying whether humans are the source of these bacteria is crucial for remediation. DNA studies could be done but are expensive and require reference materials. Recently, the Narrow River Preservation Association (NRPA) hosted two dogs with a new approach to this problem known as canine detection, in which humans combine their efforts with the keen senses of their best friends to identify sources of contamination. These dogs have been trained to detect smells of human origin and ignore other smells such as animal waste.

In 2001, a Rhode Island Department of Environmental Management (RIDEM) report[1] discussed mitigation methods for bacterial contamination, such as retrofitting storm drains, building sand filters and detention ponds for stormwater, and adding bioswales. The watershed towns have been using those methods. RIDEM has done both dry weather and wet weather bacterial sampling and monitoring for illicit connections to stormwater pipes. NRPA, the state-designated watershed council for this estuary, has worked with the towns and RIDEM to educate watershed residents on ways they can help, such as not feeding waterfowl, removing pet waste, and maintaining a vegetated buffer along the river.

Nevertheless, although improvements can be seen, there are still high bacterial levels in the southern part of the estuary and in most of the incoming streams, as reported in NRPA's compilation of 25 years of River Watch data.[2] Studies conducted with funds from the US Fish and Wildlife Service and the Rhode Island Rivers Council have investigated these high bacteria levels and their potential sources, and have tested streams for indicators of human contamination including potassium, fluoride, surfactants, and fluorescence (optical brighteners). However, the results have been inconclusive.

Canine detection is a cost-effective alternative. In 2018, NRPA, with a grant from The Nature Conservancy and US Fish and Wildlife Service, in conjunction with RIDEM, and with the cooperation of the towns of Narragansett and South Kingstown, hired Environmental Canine Services of Otisfield, Maine.[3] They have used dogs trained to detect human contamination at over 75 on-site projects in 16 states and samples have been sent to them for analysis (sniffing) from 13 states. The dogs can sniff water samples, stormwater structures systems, surface water, river water, and even soils, and signal if there is human contamination. Many of the dogs were found in shelters and selected for their agreeable demeanor and acute sense of smell. Each dog has a specific way to signal to their handler that they have identified human sewage, such as sitting or barking until their handler recognizes the response.



Canines detect sewage in stormwater systems or surface waters from leaking or broken sewer lines, faulty septic systems, or illicit connections. Diagram: Environmental Canine Services

During Phase 1 (Ship and Sniff) of the Narrow River project in May 2018, scientists from NRPA and RIDEM collected samples from 13 sites of concern and shipped them to the Environmental Canine Services' laboratory. The dogs identified human sources at three of those sites. During Phase 2 (Onsite Canine Detection), two dogs, Kai and Remi, and their handlers came to the three areas of concern and worked on tracing the smell of human contamination to its source. The dogs' responses were marked on town maps of the sewer and stormwater infrastructures.

Advantages of this method are many. Human sources can be immediately identified while in the field (no waiting for lab analyses to be completed), and traced to their origin. The dogs can walk a neighborhood and identify where there are problems. The dogs are able to detect human sources in water with low levels of fecal coliform bacteria (less than 10cfm/100 ml), in old sewage (which may not have much bacteria), in sewage that has had UV treatment, in dry areas that previously had sewage, and in soils or vegetated areas exposed to groundwater with sewage. This was demonstrated in our study by the dogs distinguishing between different areas with different soils and different sources. Also, the dogs are unbiased; they do not have pre-conceived ideas of where contamination might be. The dogs sometimes had positive responses when we did not think there was a human sewage problem. The dogs' results from the field work were verified by laboratory analysis of fecal coliform bacteria and male specific bacteriophage in water samples collected at some of the sites.

NRPA and RIDEM are working with the two towns to follow up. Once problems are confirmed, plans will be made to repair leaky infrastructure and address groundwater contamination. Canine detection proved to be accurate, less expensive, and more responsive than other methods for detecting sources of human origin. NRPA hopes that this demonstration will be useful for other estuarine watershed groups in protecting their waterways.

References:

1 Rhode Island Department of Environmental Management. 2011 Fecal Coliform TMDL for the Pettaquamscutt (Narrow) River Watershed, Rhode Island. Providence, RI.

2 DeSilva, A., and V. Berounsky. 2017. Narrow River Water Quality: Trends and Findings Spanning a Quarter Century! Narrow River Preservation Association, Rhode Island.http://narrowriver.org/wp-content/uploads/2017/12/2017_11-River-Watch-25-year-summary-article.pdf

3 For more information and video clips of the dogs in action, see the Environmental Canine Services website www.ecsk9s.com

The Fate of Biogenic Carbonate in Bioturbated Sediment: Insights from a Long-Term Lugworm Exclusion Experiment

Nils Volkenborn
Stony Brook University, SUNY
Email: nils.volkenborn@stonybrook.edu

Constructing lugworm exclusion plot

Lugworm Arenicola marina

Lugworm exclusion plot 2002

Lugworm exclusion plot 2019

Over endless stretches of muddy sand
lugworms inhabit intertidal land.
Reworking the sediment year for year
and moving porewater through the benthosphere.

Particle displacement and bioirrigation,
the central components of bioturbation,
happen on contrasting temporal scales,
but in concert they constrain
the long-term effects on the bioturbated terrain.

We will return to a Wadden Sea location,
where lugworms have been excluded in an experimentation,
to explore what has happened after 17 years
in six 20 x 20 m plots, without these ecosystem engineers.

Through sediment coring, we will be testing
the long-term consequences of bioadvection and particle reworking
on authigenic and biogenic mineral distribution,
which is controlled by precipitation, transport, and dissolution.

In narrow aquaria with and without lugworm bioturbation,
we furthermore estimate porewater carbonate saturation,
using planar optode imaging
of pH, pCO_2, and oxygen,
to characterize the geochemical dynamics and conditions
that have resulted in the observed mineral speciation and depositions.

The overall goal is to better understand the biological driving force
that controls the extent to which coastal sediments act as an alkalinity source,
which ultimately will constrain
the ocean's ability to take up CO_2 from the atmospheric domain.

Editor's Note: This contribution was an abstract from the CERF 2019 Conference

CERF 2019 in Review

Student Presentation Award Winners

Congratulations to our CERF 2019 student presentation award winners! This year, we awarded prizes to the top three students (in alphabetical order) in each category.

Undergraduate Poster

Payton Billingsley, Mississippi State University
To wake, or not to wake?

Solomon Chen, University of Hawaii at Manoa
Strategic monitoring and resilience training in the Ala Wai watershed: seasonal and episodic variability

Megan N. Gillen, College of William & Mary
Influence of salinity and vegetation on tidal marsh soil shear strength

Undergraduate Oral

Gabriela Canas, University of North Florida
Assessing virtual reality technology as an environmental education teaching tool for use in classrooms

Lucas Goodman, Iowa State University
Modeling a catastrophic flooding event to improve water quality and environmental health in Southern Louisiana

Olivia Saliger, Towson University
Changes in phytoplankton biomass and composition in coastal Maryland due to eutrophication and temperature increase

Graduate Poster

Olivia Caretti, North Carolina State University
Using passive and active acoustics to assess oyster reef restoration success

Jamila Roth, University of Florida
Using interactive activities focused on seagrass ecosystems to teach children marine conservation and trophic ecology

Ethan Taulbee, Texas A & M University - Corpus Christi
Scale microchemistry as a non-lethal alternative for tracking individually variable migration patterns in mobile fish

Graduate Oral

Katherine DuBois, University of California, Davis,
Local adaptation of eelgrass linked to temperature and shading stress within a northern California estuary

Nicole Foster, University of Adelaide
Environmental DNA reveals 2,000-year history of coastal plant communities in a temperate wetland

Stephanie Wilson, Virginia Institute of Marine Science
Biogeochemical gradients in a subterranean estuary providing DIN to the York River estuary

CERF 2019 Event Code of Conduct Transparency Report

CERF has made it a priority to have the Biennial CERF Conference, and all CERF events, be safe and welcoming for all participants. For CERF 2019, we implemented a revised Event Code of Conduct. In addition to making the Code more robust, we communicated the Code broadly, developed clear mechanisms for reporting incidents, and trained all staff and two Executive Committee members on how to handle reports.

As part of our efforts to make CERF conferences safe and welcome, CERF is releasing this transparency report summarizing incidents and consequences. The Code of Conduct has a strong emphasis on confidentiality; this report has been written in such a way to avoid linking reporters with specific incidents. The goal of this transparency report is to provide the community with a sense of how the Code of Conduct functions so they can build trust in the process and recommend improvements.

At CERF 2019, we received reports of two incidents. Both a verbal and an online report came in during the meeting. Reports of incidents were addressed within hours of receiving the reports. One report was of inappropriate comments, and another of disrespectful behavior. CERF leadership reached out to both alleged violators; one verbally, and the other in writing (because they had already left the conference). One violator was given a verbal warning. In the other situation, the target of the violation felt that it was a misunderstanding and no further sanction was pursued.

As a follow-up to the conference, CERF asked if participants were aware of the new Event Code of Conduct, and whether they witnessed or were subject to violations of the Code. Of respondents, 77% said they were aware of the Code. Of 314 respondents, 19 said that they had witnessed or were subject to a violation; of those, 13 indicated that the violation was of the social media/recording policy (which is separate from the Event Code of Conduct). This information helps CERF to better understand the extent of violations, as well as how we may better implement the Code.

If you have suggestions for how we can make the next meeting more welcoming and supportive, contact spark@cerf.science.

Concepts and Controversies in Tidal Marsh Ecology Revisited: A CERF 2019 Workshop Examining the Ongoing Role of Salt Marshes in Supporting Fisheries

Ron Baker[1] and Matt Taylor[2]

[1]University of South Alabama, Dauphin Island, Alabama, USA
[2]Australia New South Wales Department of Primary Industries, Port Stephens Fisheries Institute, Nelson Bay, NSW, Australia
Email: baker@disl.org

Top: Participants at the workshop
Above: Guest panel: (from L to R) Mike Weinstein, Carolyn Currin, Ken Able, Mike Beck, Lawrence Rozas, Si Simenstad, Gene Turner, Linda Deegan, Just Cebrian, Tom Minello, Rod Connolly, Candy Feller

More than 60 scientists, managers and restoration practitioners converged on the Dauphin Island Sea Lab for a 2-day workshop on the role of tidal marshes in supporting fisheries. Participants spanned from undergraduate students to recently retired leaders of the field. Keynotes from Mike Weinstein, editor of the 2000 book from which the meeting drew its name, and Ken Able, a leader on fish ecology in marsh ecosystems, were followed by a series of presentations to set the scene and identify key issues confronting tidal marshes and their ongoing role in providing benefits to human society. The presentations were followed by a panel discussion where our 12 invited leading scientists offered their thoughts, views, and sometimes conflicting opinions and advice on how to best move the field forward over the coming decades.

The emergent themes were: the overriding impact of sea level rise on these intertidal ecosystems; that salt marshes form part of an interconnected mosaic of coastal ecosystems that combine to support fisheries; that these are embedded in an increasingly modified landscape facing multiple forms of global change; that as a society we do not fully value the range of benefits salt marshes provide us; and that future management decisions can still benefit greatly from enhanced understanding of the basic natural history of these ecosystems.

These and other themes were delved into during break-out groups on day 2, and will form the basis of several Perspectives papers submitted to a special issue of *Estuaries and Coasts*. Our hope is that, like the "Concepts and Controversies" book from 2000, these papers will help guide research on tidal marshes and their support of fisheries over the coming decades. The special issue is open to submissions of papers broadly relevant to tidal marsh support of fisheries. Submission inquiries should be directed to Ron Baker (rbaker@disl.org) or Matt Taylor (matt.taylor@dpi.nsw.gov.au) prior to the final submission deadline in May 2020.

We thank our sponsors: Dauphin Island Sea Lab, University of South Alabama, Mississippi-Alabama Sea Grant, Grand Bay National Estuarine Research Reserve, Georgia Sea Grant, Washington Sea Grant, and Mr. George Davis via the DISL Foundation.

Outcomes from Two CERF 2019 Workshops: "Best Practices in Science Communication" and "Analyzing, Synthesizing and Communicating Your Data"

Bill Dennison and Heath Kelsey

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Two back-to-back CERF workshops; "Best Practices in Science Communication" and "Analyzing, Synthesizing and Communicating Your Data" were conducted on Sunday morning (sadly, BEFORE coffee was available). Bill Dennison and Health Kelsey provided workbooks and colored pens to participants who were from the East, Gulf and West coasts of the U.S. as well as Australia (colored pens were a hit).

The primary focus of the training was to help a) develop powerful narratives, b) create synthetic visualizations, and c) introduce a diversity of resources. Workshop participants provided a diversity of science synthesis and communication examples from their respective far-flung locations (we were impressed with their ability to cope with jet lag).

The interactive sessions included a round of "Conceptionary" illustrating, some creative drawing skills, a round of "Title Pursuit" in which participants generated pithy descriptive titles, and structuring a story using the "… and… but… therefore…" template.

These short sessions were only able to introduce basic concepts, so the parting emphasis was to encourage participants to continue to pursue scientific synthesis and communication. It was fun to catch up with workshop participants throughout the rest of the conference.

Additional science communication resources:
Randy Olson on narrative structure
storycirclestraining.com
Edward Tufte on presenting data
edwardtufte.com
David McCandless on presenting data
informationisbeautiful.net
Eric Eckl on conservation communication
waterwordsthatwork.com
John Sturtevant on clear communication
johnsturtevant.com
Integration & Application Network on science visualization
sciencevisualizationclass.wordpress.com

CERF Taking Action to Understand and Increase Awareness of Implicit Bias

Treda Grayson[1] and Franklin Trimm[2]

[1]U.S. Environmental Protection Agency, Office of Water
[2]University of South Alabama, College of Medicine
Email: grayson.treda@epa.gov

CERF is committed to promoting a diverse and inclusive culture at all levels of the Federation, and a Sunday workshop titled "Out in the Open: Identifying, Understanding and Addressing Implicit Bias" was provided at CERF 2019 to provide attendees with tools to help themselves and others become more aware of diversity and the barriers to achieving it. Dr. Franklin Trimm, of the University of South Alabama College of Medicine, guided participants through discussions and exercises to explore and become aware of social stereotypes that form outside of our own conscious awareness, known as implicit or unconscious bias. These biases can lead to unfair prejudices or favoring for or against individuals or groups, setting up constructs of exclusion rather than inclusion.

Over the course of the three-hour workshop, attendees gained an understanding of the cultural, group, individual, and institutional "lenses" through which we all process the world and fuel the tendency or inclination to make judgments (biases) without question. Bias is not something that one can erase, but there are ways by which one can mitigate bias:

1. Challenge biases and stereotypes.
2. Try to take on the perspective of others.
3. Retrain the brain.
4. Interrupt automatic biased thoughts.

If you are interested in learning more about implicit bias and even testing your level of unconscious bias, check out Project Implicit (www.implicit.harvard.edu) and the Implicit Bias Module Series (kirwaninstitute.osu.edu/implicit-bias-training).

CERF 2019 in Review

CERF 2019 in Review

Legacy Fund Scholarship

CERF is proud to announce the recipient of the first Legacy Fund Scholarship. Jamila Roth, a PhD candidate at the University of Florida, was selected for the inaugural award.

Roth studies how seagrass species diversity impacts their resistance and resilience to warming temperatures. Not only do warming temperatures affect the physiology of the seagrasses, but they also change grazing pressure, as tropical species such as green turtles, manatees, and parrotfish move northward. She is investigating the three most common seagrass species in the Gulf of Mexico (*Halodule wrightii, Syringodium filiforme,* and *Thalassia testudinum*). Roth currently has funding to study four different possible responses to these warming temperatures. The Legacy Fund Scholarship will allow her to augment her research by studying an additional response: changes in chemical defenses. Roth's research will help understand the defenses these seagrasses may have to increased grazing pressure. The results of her research may inform management and restoration of seagrass populations in order to maintain valuable ecosystem services and functions.

CERF sponsors the Legacy Fund Scholarship for student and early career members of the Federation to enhance the research and career development of the next generation of coastal and estuarine scientists and managers. This scholarship is supported through generous donations to the CERF Legacy Fund. Funds are intended to be used for a unique and valuable enhancement to the recipient's research or career development. CERF received 28 applications for the 2019 CERF Legacy Fund Scholarship program.

The CERF Legacy Fund honors scientists, resource managers, decision-makers, educators, and others for their important contributions to the understanding and wise stewardship of estuarine and coastal ecosystems worldwide. The Legacy Fund was first established in 2018 with a generous donation of $12,333 in honor of long time CERF member Holly Greening's retirement from the Tampa Bay Estuary Program. Donations are accepted at: https://www.cerf.science/donate#funds.

Learn more about the CERF Legacy Fund Scholarship Program: https://www.cerf.science/cerf-legacy-fund-scholarship.

2019 Rising TIDES Conference Program

2019 Rising TIDES students and mentors

CERF was proud to welcome the recipients of the 2019 Rising TIDES (Toward an Inclusive, Diverse, and Enriched Society) Conference Program to Mobile for the 25th Biennial Conference. Rising TIDES jointly supported 14 underrepresented minority (URM) students and their mentors to participate in CERF 2019:

Kailani Acosta, Ph.D. student, Columbia University. Mentor: *Lori Sutter*, University of Georgia

Kelcie Chiquillo, Ph.D. student, University of California, Los Angeles. Mentor: *Tiara Moore*, University of Washington and The Nature Conservancy

Nicholas Coleman, undergraduate senior, Coastal Carolina University. Mentor: *William Ball,* Johns Hopkins University and Chesapeake Research Consortium

Johanna Dieudonne, undergraduate junior, Georgia Southern University. Mentor: *John Carroll*, Georgia Southern University

Emelie Foster, undergraduate senior, University of Louisiana at Lafayette. Mentor: *Anna Armitage*, Texas A&M University Galveston

Hannah Hayes, undergraduate senior, University of California Los Angeles. Mentor: *Julie Schram*, University of Oregon

Alfonso Macias-Tapia, Ph.D. student, Old Dominion University. Mentor: *Xuan Chen*, Salisbury University

Steven Manos, undergraduate sophomore, Portland Community College. Mentor: *Julie Schram*, University of Oregon

Kayla Martinez-Soto, master's student, Virginia Institute of Marine Science. Mentor: *David Johnson*, Virginia Institute of Marine Science

Cheryl Patel, master's student, San Francisco State University. Mentor: *Chris Madden*, South Florida Water Management District

Danielle Perry, Ph.D. student, University of Rhode Island. Mentor: *Cathleen Wigand*, U.S. Environmental Protection Agency

Joseph Reustle, Ph.D. student, Texas A&M University - Corpus Christi. Mentor: *Linda Bui*, Louisiana State University

Sommer Starr, master's student, University of Alabama. Mentor: *Corianne Tatariw*, University of Alabama

Jennifer Zhu, Ph.D. student, The Graduate Center CUNY. Mentor: *J. Stephen Gosnell*, The Graduate Center CUNY

Through joint support of both students and mentors, this program aims to enhance career development of URM students, ensure that students participating in the program will have sustained mentorship following the conference, help develop a community of practice for CERF members who are engaged in building diversity and inclusion within their own organizations and across institutions, and involve those who are already mentors of URM students in helping to transform CERF into a broadly inclusive society. In addition to the full suite of scientific sessions and other conference activities, students and their mentors participated in a workshop with expert panelists and key CERF members and partners who are leaders in diversity, with the goal of inspiring and motivating URM students to pursue career pathways in coastal and estuarine science. Diversity, inclusion, and equity themes were infused throughout the regular conference programming for the benefit of all attendees. The 2019 Program was supported by the National Science Foundation (award number 1928845) and contributions from CERF.

The Rising TIDES Conference Program is part of a comprehensive initiative to enhance diversity and inclusion in CERF and coastal and estuarine sciences. Learn more about Rising TIDES: https://www.cerf.science/risingtides

The Latest Coastal & Estuarine Science News (CESN)

Merryl Alber, Managing Editor
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Coastal & Estuarine Science News (CESN) is a free electronic publication providing brief summaries of select articles from the journal *Estuaries and Coasts* that emphasize management applications of scientific findings. Go to the CESN website at www.cerf.science/cesn to read the full summaries and sign up to have future issues delivered to your email inbox.

NOVEMBER 2019

Does Hypoxia Change the Menu? Gulf of Mexico fish show variable effect of low oxygen events on food web

Glaspie, C.N. et al. 2019. Fish diet shifts associated with the northern Gulf of Mexico hypoxic zone. DOI: 10.1007/s12237-019-00626-x
https://www.cerf.science/cesn-november-2019#Article1

Putting Small Restoration Projects to the Test: New framework evaluates long-term effectiveness on water quality in Tampa Bay

Beck, M.W. et al. 2019. Assessment of the Cumulative Effects of Restoration Activities on Water Quality in Tampa Bay, Florida. DOI: 10.1007/s12237-019-00619-w
https://www.cerf.science/cesn-november-2019#Article2

Cues from Chlorophyll: Finding patterns in eutrophication indicators in Biscayne Bay

Millette, N.C., C. Kelble, A. Linhoss, S. Ashby, and L. Visser. 2019. Using Spatial Variability in the Rate of Change of Chlorophyll a to Improve Water Quality Management in a Subtropical Oligotrophic Estuary. DOI: 10.1007/s12237-019-00610-5
https://www.cerf.science/cesn-november-2019#Article3

Restored vs. Natural Marsh: Is It All the Same to Nekton? Analysis shows lower nekton density in restored marshes

Hollweg, T.A et al. 2019. Meta-Analysis of Nekton Recovery Following Marsh Restoration in the Northern Gulf of Mexico. DOI: 10.1007/s12237-019-00630-1
https://www.cerf.science/cesn-november-2019#Article4

SEPTEMBER 2019

The Other Side of Dam Removal: Machine learning suggests suspended sediment drives macroalgal loss

Glover, H., A.S. Ogston, I.M. Miller, et al. 2019. Impacts of suspended sediment in nearshore benthic light availability following dam removal in a small mountainous river: in-situ observations and statistical modeling. DOI: 10.1007/s12237-019-00602-5
https://www.cerf.science/cesn-september-2019#Article1

Hurricane Harvey Tests Coastal Ecosystem Protection: Mangroves provide better erosion protection, while marshes are more resilient

Armitage, A.R., C.A. Weaver, J.S. Kominoski, and S.C. Pennings. 2019. Resistance to Hurricane Effects Varies Among Wetland Vegetation Types in the Marsh–Mangrove Ecotone. DOI: 10.1007/s12237-019-00577-3
https://www.cerf.science/cesn-september-2019#Article2

Did Hurricane Sandy Change the Ecosystem of a Long Island Lagoon? Research shows post-storm shifts in salinity and community structure

Olin, J.A, R.M Cerrato, J.A. Nye et al. 2019. Evidence for Ecosystem Changes Within a Temperate Lagoon Following a Hurricane-Induced Barrier Island Breach. DOI: 10.1007/s12237-019-00593-3
https://www.cerf.science/cesn-september-2019#Article3

Resilience and Recovery in Biscayne Bay: Water quality and phytoplankton communities recovered quickly after Hurricane Irma

Wachnicka, A., J. Browder, T. Jackson, et al. 2019. Hurricane Irma's Impact on Water Quality and Phytoplankton Communities in Biscayne Bay (Florida, USA). DOI: 10.1007/s12237-019-00592-4
https://www.cerf.science/cesn-september-2019#Article4

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Ashley McDonald, Emelie Foster, Sophia Hoffman, David Yoskowitz, and friend are ready for the opening second line parade.

GERS Post CERF Update

The 2019 CERF conference in Mobile, Alabama, was held in the heart of GERS country, and we made the most of it! GERS members formed a krewe for the Second Line Procession following the opening ceremony. Members had fun donning mosquito-themed costumes and tossing marsh-related throws, including mosquito wipes, Sharpies, and of course, Mardi Gras beads.

At its annual business meeting, GERS welcomed the incoming 2019-2021 Officers: Anna Armitage (Past President), Megan La Peyre (President), Kelly Darnell (President-Elect), Zachary Darnell (Secretary-Treasurer), Donna Devlin (Member-at-Large), Brian Roberts (Member-at-Large), and Janelle Goeke (Student Representative). In addition, Emelia Marshall will be joining the GERS Executive Committee as the Media Coordinator. On behalf of all GERS members, we thank outgoing board members for their dedicated service: Mike Murrell (Past President), Mark Woodrey (Member-at-Large), Melissa McCutcheon (Student Representative), and Erin Kinney (Media Coordinator).

GERS members and affiliates made a strong showing at the CERF 2019 meeting, with dozens of talks and posters about Gulf of Mexico science. The GERS board was thrilled to award 12 students from eight different universities with awards to subsidize travel to the CERF 2019 meeting.

The next GERS meeting will be held in Baton Rouge in October 2020. We look forward to seeing everyone there! Follow our social media pages (@GulfEstuarineRS on Twitter and Facebook) and website (http://www.gers.us) for the latest meeting updates.

Incoming GERS Officers, L to R: Janelle Goeke, Brian Roberts, Zachary Darnell, Kelly Darnell, Megan La Peyre, Anna Armitage

GERS student travel award winners for CERF 2019, in alphabetical order: Donnie Day, Kenneth Hayes, Christina Hoelscher, Aubrey Looby, Emelia Marshall, Erika Neat, Mahmoud Omar, Carissa Pinon, Harris Stevens, Caleb Taylor, Zachary Topor. Not pictured: Scott Alford

GERS members join the other affiliate societies for a festive opening parade.

SEERS
Post CERF Update

SEERS had a fantastic showing at CERF 2019 in Mobile, Alabama. We had a great time meeting new colleagues and reconnecting with old friends. Our reusable straws were a big hit during the Mardi Gras parade, where we also debuted a new set of T-shirt designs. We would also like to congratulate all of our student awardees who attended the conference. Our Student Travel Awardees were Aaron Ramus, Elena Solohin, and Sarah Zaunbrecher. Our 2019 Rising Tide Awardees were Nicholas Coleman and Johanna Dieudonne. Congratulations to all of these amazing student researchers! (Picture shows SEERS Student Representative, Mariko Polk, at our CERF booth.)

Spring 2020 Meeting & Announcements

For our Spring 2020 meeting we will be at the Holiday Inn Resort on Jekyll Island, Georgia! We hope to see everyone there, 19-21 March. A huge thanks goes to the organizing committee and our local host, Rachel Guy, the Research Monitoring and Program Coordinator with Sapelo Island NERR! Watch the SEERS website for information on abstract submission, Student Travel Award information, and registration.

SEERS is also looking for nominations for two Board Member positions: President-elect and Program Chair. Self-nominations are encouraged and terms will be Spring 2020-2022. Nominations are due by 1 February 2020. The President-elect will work closely with the current President and chair the Student Promotion Committee. The Program Chair implements Society policy with regards to meeting conduct and content. Please contact us if you are interested in nominating someone (or self-nominating) for these positions, or would like to learn more about the duties.

Student Spotlight

Emory Wellman is seeking her MS in Biology from East Carolina University. She is part of the Coastal Ecology Lab under Dr. Rachel Gittman. Emory's research focuses on salt marsh and oyster restoration, and the ways in which restoration can be designed to enhance delivery of coastal ecosystem services, particularly the services of erosion prevention and storm protection. Her interests revolve around the phenomenon of interspecific facilitation, and the ways in which joint restoration of coastal ecosystem engineers (like salt marsh vegetation and bivalves) can enhance each other's growth and success. She hopes to make her results relevant to coastal policy makers and managers, and inform the ways that we sustainably develop and protect our coasts. SEERS is proud of Emory and the great research she is doing!

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