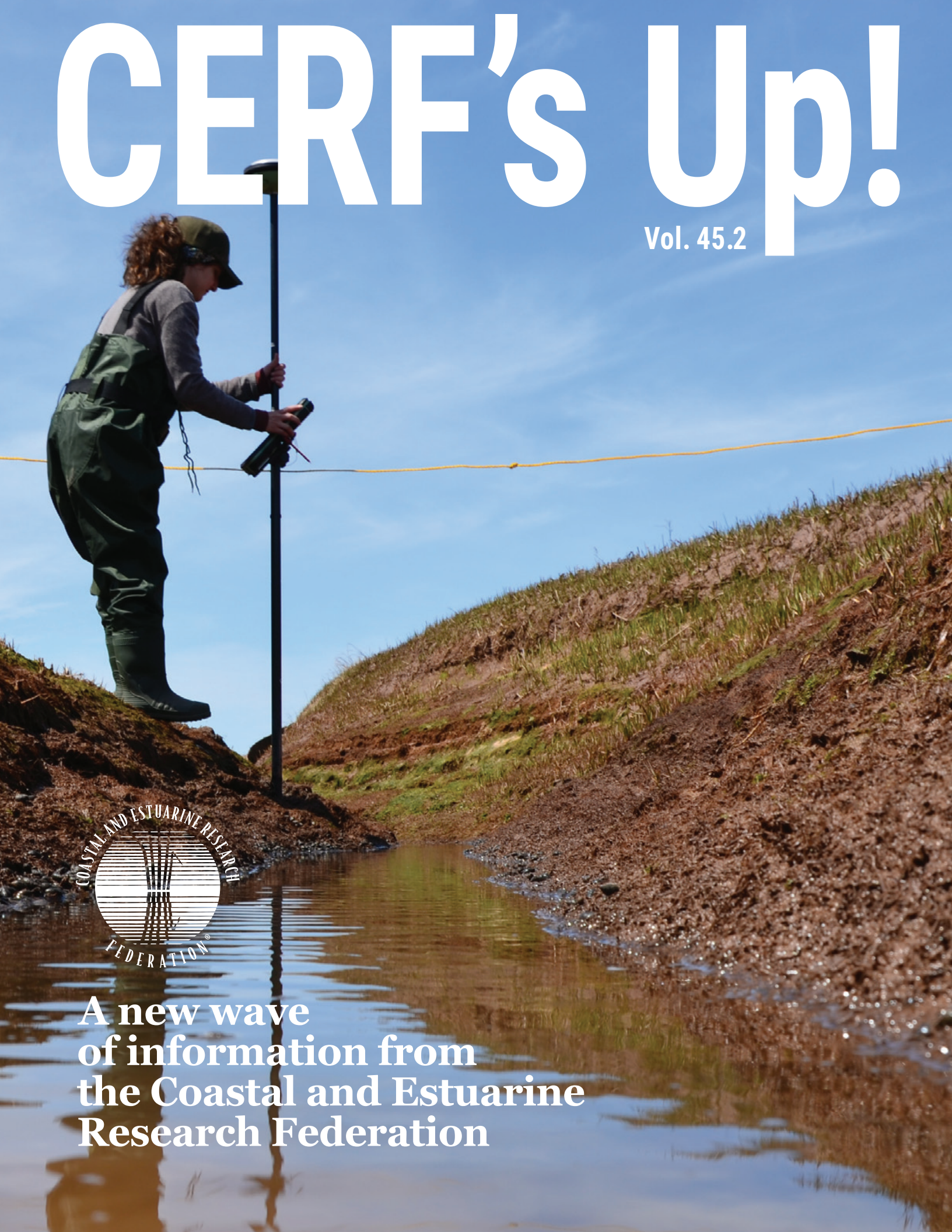
CERF's Up!

Vol. 45.2



COASTAL AND ESTUARINE RESEARCH FEDERATION

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

CERF's Up!

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Cover photo: Student from Saint Mary's University measures elevation profile in a restored marsh site in Nova Scotia. Check out the Atlantic Canada Coastal & Estuarine Science Society for more information from one of our Canadian Affiliate Societies.

Rising TIDES (Toward an Inclusive, Diverse, and Enriched Society): A Message from the President

Hilary Neckles

CERF's "Visions IV" strategic plan includes an objective to build a more inclusive and diverse Federation. This is more than a laudable goal: ensuring a culture and an environment in which differences are embraced, individual identities are valued, and all people feel welcomed and respected is fundamental to our core values and essential to our success. Rising TIDES[1] (Toward an Inclusive, Diverse, and Enriched Society) is a comprehensive program for enhancing the diversity and inclusion of our scientific society and CERF conferences. I'm pleased to share some advances CERF has made over the past year toward this objective.

Many of the actions directed toward diversity, equity, and inclusion within our Federation are spearheaded by CERF's Broadening Participation Council (BPC). At the April 2019 meeting of the CERF Governing Board, BPC Chair Treda Grayson presented a new Broadening Participation Comprehensive Plan[2] to strong Board endorsement. This plan arose from deep conversations at CERF 2017 surrounding the multiplicity of barriers that contribute to underrepresentation of people from minority groups in coastal and estuarine science. Discussions during workshops and wider conference venues led to increased awareness of how social identities shape interactions, and the biases that continue to influence engagement across differences. The plan contains actionable steps for including a more diverse set of people in CERF membership and activities and for aligning our organizational climate with our cultural aspirations.

Inclusion is multifaceted. In particular, for people to feel welcomed they must also feel safe. I have reported previously on CERF's sustained efforts to promote environments that are free from sexual harassment and

are intentionally inclusive toward LGBTQ+ people; visit the revised Event Code of Conduct[3] and the new conference Safe and Welcoming Plan[4] for details. CERF also updated its Code of Ethics and Society Bylaws to define sexual harassment and discrimination as professional misconduct and potential grounds for member termination. Recently, in recognition that the pervasiveness of sexual harassment undermines full participation in the scientific enterprise, CERF has joined with 99 other professional disciplinary organizations to launch the Societies Consortium on Sexual Harassment in STEMM (science, technology, engineering, mathematics, and medicine). As an inaugural member of the Consortium, CERF adds to a collective voice that is driving shared expectations for professional conduct.

In April the Governing Board also discussed expanding opportunities to incorporate traditional ecological knowledge into CERF science and practice. The Board agreed that CERF's commitment to broadening participation should include integrating the knowledge of Indigenous Peoples and local communities into developing effective solutions to coastal problems. An excellent example of blending complementary ways of knowing to improve coastal restoration decision-making was presented by Matt Bethel and DeWitt Braud through CERF's webinar series this year; CERF members who missed this inspirational case study can find the recording in the online video library.

These many facets of inclusivity will soon come together at CERF 2019[5] in Mobile, Alabama, under the leadership of conference co-chairs Leila Hamdan and David Yoskowitz and their amazing conference team. From plenary panels offering diverse perspectives and life experiences to rich scientific sessions permeated with cultural heritage and coastal humanities, CERF 2019 promises to enhance our capacity to address complex coastal challenges. I can't wait to see many of you there.

[1]https://www.cerf.science/risingtides [2]https://www.cerf.science/safe-and-welcoming-cerf [3]https://www.cerf.science/event-code-of-conduct [4]https://www.cerf.science/safe-and-welcoming-cerf [5]https://www.cerf.science/cerf-2019

2019 Rising TIDES
(Toward an inclusive, Diverse, and Enriched Society)
Conference Program

2017 Rising TIDES Conference Program students and mentors

CERF is pleased to announce the 2019 Rising TIDES Conference Program! Rising TIDES provides financial support for underrepresented minority (URM) students and their mentors to participate in the 25th Biennial CERF Conference in Mobile, AL, on 3-7 November 2019. With funding from the National Science Foundation (NSF) and CERF, we plan to support 14 students and mentors to participate in a Rising TIDES workshop, scientific sessions, and other conference activities. Through joint support of both students and mentors, this program aims to enhance career development of URM students and ensure that students participating in the program will have sustained mentorship following the conference. The program also helps to develop a community of practice for CERF members who are engaged in building diversity and inclusion within their own organizations and across institutions, and involves those who are already mentors of URM students in helping to transform CERF into a broadly inclusive society. The deadline for applications for 2019 was 26 June. CERF is committed to broadening participation in coastal and estuarine science and management – please monitor the Rising TIDES website[1] for more details.

[1] https://www.cerf.science/risingtides

CERF Announces New Legacy Fund and Scholarship Opportunity

CERF is excited to announce the creation of a new Legacy Fund. The Legacy Fund is a way to honor 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 Fund will support unique and valuable enhancements to the research or career development of student and early-career members of the Federation through scholarships given at the CERF Biennial Conference.

The Legacy Fund was first established in 2018 with a generous donation of $12,333 in honor of Holly Greening's retirement. We encourage you to recognize other CERF legends through donations[1] in their honor

About the Scholarship:

CERF is excited to announce the establishment of a new Legacy Fund Scholarship program. The program provides scholarships 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. CERF anticipates awarding one US $1000 scholarship in 2019.

The application submission deadline was 30 June 2019. Thank you to those who submitted applications. You will be contacted soon!

[1] https://www.cerf.science/donate

CERF Releases Broadening Participation Comprehensive Plan

CERF is dedicated to broadening participation in coastal and estuarine science and management. As part of its Rising TIDES (Toward an Inclusive, Diverse, and Enriched Society) program, the Broadening Participation Council has developed a comprehensive plan to promote an inclusive culture and opportunities for underrepresented and underserved minorities in coastal and estuarine science at all career stages.

The plan is based upon input received from CERF members and attendees during facilitated workshops and guided discussions at the 2017 CERF conference. The plan is focused on three categories: building representational diversity, or the proportional representation of underrepresented minorities within CERF membership, activities, and disciplines; committing to structural diversity, or the incorporation of diversity into leadership, policies, and practices; and fostering interactional diversity, or opportunities for people with diverse backgrounds and life experiences to interact in meaningful ways. Read the full plan and learn more about Rising TIDES at: https://www.cerf.science/risingtides

2019-2021 CERF Governing Board Election

We invite you to make your voice heard in the future of the Federation. Voting is now open for the 2019–2021 CERF Governing Board elections to elect our next President-elect, Secretary, two Members-at-large, and student Member-at-large. Only one individual will be selected for each position except Member-at-large, for which we are electing two individuals. The candidates for office are listed below; their full bios and statements are available online[3].

An online voting form was sent to all eligible voting members. Please remember to submit your vote by 12 July 2019.

On behalf of the current and future Governing Board members, thank you for participation in this important election.

President-Elect

Leila Hamdan, Associate Professor, University of Southern Mississippi

Enrique Reyes, Professor, East Carolina University

Secretary

Jason Stutes, Senior Marine Ecologist, GeoEngineers

Jamie Vaudrey, Assistant Research Professor, University of Connecticut

Student Member-at-large

Derek Detweiler, Ph.D. student, Virginia Institute of Marine Science

Meredith Diskin, M.S. student, Dauphin Island Sea Lab

Johnny Quispe, Ph.D. student, Rutgers University

Serina Wittyngham, Ph.D. student, Virginia Institute of Marine Science

Member-at-large (2 positions)

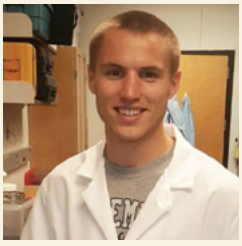
Neil Ganju, Research Oceanographer, US Geological Survey

Chris Madden, Lead Scientist, South Florida Water Management District

Thomas Mozdzer, Associate Professor, Bryn Mawr College

Jennifer Beseres Pollack, Associate Professor, Harte Research Institute, Texas A&M University-Corpus Christi

Kristin Wilson Grimes, Research Assistant Professor, University of the Virgin Islands



Derek Detweiler
Student Member-at-large

Meredith Diskin
Student Member-at-large

Neil Ganju
Member-at-large

Kristin Grimes
Member-at-large

Leila Hamdan
President

Chris Madden
Member-at-large

Thomas Mozdzer
Member-at-large

Jennifer Pollack
Member-at-large

Johnny Quispe
Student Member-at-large

Enrique Reyes
President

Jason Stutes
Secretary

Jamie Vaudrey
Secretary

Serina Wittyngham
Student Member-at-large

[3] https://www.cerf.science/2019-2021-governing-board-slate

CERF Joins Societies Consortium on Sexual Harassment in STEMM

CERF has joined with 99 organizations to launch the Societies Consortium[1] on Sexual Harassment in STEMM (science, technology, engineering, mathematics, and medicine) to advance professional and ethical conduct, climate, and culture in STEMM disciplines.

The Societies Consortium reflects a shared understanding that professional societies have a unique responsibility in their role as standard-setters and standard-bearers for STEMM fields to address the pervasive problem of sexual and gender harassment.

Focused on advancing full participation and excellence in STEMM and preventing and responding to sexual and gender harassment in STEMM environments, the Societies Consortium will provide research and evidence-based resources and guidance to address sexual harassment in the member societies' operations and more broadly within the fields they represent.

It was established by the American Association for the Advancement of Science (AAAS), the Association of American Medical Colleges (AAMC), and the American Geophysical Union (AGU), with Education Counsel serving as the policy and law consultant for the initiative; CERF is one of 100 Inaugural Members representing a wide range of STEMM fields.

More information, including a list of the Inaugural Members, can be found at: http://educationcounsel.com/societiesconsortium/

CERF is committed to providing a safe and welcoming culture and environment for all its members and conference participants. CERF has recently revised its Code of Ethics[2] to include harassment and discrimination as professional misconduct.

CERF has also updated its Event Code of Conduct[3] to clearly outline expected and prohibited behavior at the CERF Biennial Conference and all CERF events, and provide mechanisms to report unacceptable behavior and implement corrective actions.

Ensuring respect and safety for everyone who engages with CERF is fundamental to our values and essential to our success" said Hilary Neckles, CERF President. "As an inaugural member of the Societies Consortium, CERF joins a groundbreaking collective voice leading the charge to end sexual harassment in the sciences.

[1] http://educationcounsel.com/societiesconsortium/
[2] https://cerf.memberclicks.net/assets/docs/2018/CERF%20Code%20of%20Ethics%2010-19-2018.pdf
[3] https://cerf.memberclicks.net/assets/docs/2018/CERF%20Event%20Code%20of%20Conduct%2010-19-2018.pdf

The Latest Coastal & Estuarine Science News

Merryl Alber, Managing Editor
Claudia Geib, Science Writer/Coordinating Editor

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.

MARCH 2019

Eelgrass habitat not a straightforward boon for oysters

Influence of eelgrass is offset by species identity, predators, and food availability

Oysters and the habitats they create offer many benefits for coastal ecosystems, as well as the potential for commercial harvesting. The presence of seagrasses, such as eelgrass, is thought to benefit oysters, and seagrass beds are often targeted for oyster seeding—yet a recent study shows that the relationship between oysters and seagrass is far from a simple one.

www.cerf.science/cesn-march-2019#Article1

Assessing the risks of harbor dredging on diamondback terrapins

Cape Cod's terrapins at low risk during winter dredging

Wellfleet Harbor, in Cape Cod, Massachusetts, is host to the northernmost population of diamondback terrapin turtles, which are listed as threatened under the state Endangered Species Act. During the winter this turtle enters a hibernation state known as brumation, during which they lie in immobile clusters on the seafloor. Terrapins in this state are at considerable risk of mortality if they brumate within part of a harbor that is dredged to maintain navigation channels, which is an activity generally reserved for the winter in order to minimize disruption to the ecosystem.

www.cerf.science/cesn-march-2019#Article2

Bridging the harbor: Do phytoplankton respond?

Shallow reefs could shelter low-lying marshes from erosion

In the late 1950s a bridge was built across Shippagan Harbor, a coastal strait in New Brunswick, Canada. The bridge divided the area into an inner and outer bay, and decreased fetch over the inner bay by 76 percent. In a recent paper, researchers evaluated whether such a dramatic change affected phytoplankton. They hypothesized that the bridge should have led to a higher abundance of phytoplankton in the inner bay, as reduced hydrological flow concentrated nutrients from the land and altered the geochemistry of the inner as compared to the outer bay. They evaluated this based on algal pigment concentration and sediment organic matter, measured in a series of sediment cores that approximately dated back to 1930.

www.cerf.science/cesn-march-2019#Article3

High temperatures and macroalgae make a deadly duo

Warm waters and algal blooms combine to cause coastal hypoxia

Macroalgal blooms and rising water temperatures are increasingly frequent and co-occurring threats to marine life. Both of these stressors have long been linked to low oxygen conditions in coastal areas—yet their combined effect on hypoxia occurrence and intensity remains poorly understood, especially given that drift algae is difficult to study. Recent research in the shallow, eutrophic Nakaumi Lagoon in western Japan used drift algae within enclosures to simulate the synergistic influence that these factors have on oxygen concentrations.

www.cerf.science/cesn-march-2019#Article4

MAY 2019

Comparing the ecosystem filtration services of native and non-native oysters

Strategic seeding can maximize filtration

One of the great benefits of cultivating oysters comes from their feeding activity, which removes suspended particulate matter from the water. On the west coast of the U.S., the presumed filtration values of native Olympia oysters (Ostrea lurida) has been a strong motivator for restoration efforts aimed at replacing the dominant, but non-native Pacific oyster (Crassostrea gigas)—yet the actual filtration values of these two species has not been compared.

www.cerf.science/cesn-may-2019#Article1

Welcome

to Our New CESN Science Writer/Coordinating Editor: Claudia Geib

Meet Claudia Geib, CERF's new Coastal and Estuarine Science News (CESN) Science Writer/Coordinating Editor! Claudia is a science writer and editor based in Falmouth, Massachusetts. She has a Master's degree in Science Writing from MIT, and focuses her work on marine and environmental science. You can find her writing in publications including National Geographic, Hakai Magazine, Futurism, and Atlas Obscura. Her editorial work with institutions like Woods Hole Oceanographic Institution, Marine Biological Laboratory, and the Buzzards Bay Coalition has sought to make scientific research and progress more widely accessible, a skill she hopes to put to good use at CESN. Outside of work, she is a swimmer, diver, and sailor, and when not in or on the water is usually somewhere near it.

CESN is an electronic newsletter that is put out on a bimonthly basis (6 issues per year) and serves as a companion to the journal Estuaries and Coasts. Each issue of CESN provides a summary of four articles from the journal, written for an audience of coastal managers and other interested stakeholders and emphasizing the management applications of scientific findings. Issues are posted online and in CERF's Up!, and emailed to subscribers. Learn more at https://www.cerf.science/cesn.

CESN *(continued)*
MAY 2019

Taking a holistic look at marsh sediment dynamics *Both vertical and lateral movement must be considered in marsh restoration*

Some marsh restoration efforts focus on shoreline protection and limiting lateral erosion, such as constructing living shorelines. Other projects are aimed at increasing vertical elevation, such as through thin layer placement of sediment. In a new perspective article, author Neil K. Ganju contends that these marsh restoration projects do not generally consider the full sediment dynamics of a system, and that a focus on preventing lateral erosion near a channel can actually reduce the material available for maintaining the elevation of the marsh edge and interior.

www.cerf.science/cesn-may-2019#Article2

Is plant diversity important for protecting coastal dunes? *Functional richness does not necessarily reduce wave erosion*

Vegetation is known to play an important role in protecting coastal dunes from erosion. Yet, given that dune species can have different effects on sediment transport, increased species richness might increase erosion control on coastal dunes. The authors of a new study evaluated this idea by comparing the erosion control of three common dune species grown alone or in combination.

www.cerf.science/cesn-may-2019#Article3

Evaluating restored wetlands in Northern Gulf of Mexico *Comparisons help benchmark recovery for vegetation and soil*

When is a restored wetland considered "recovered"? Even as coastal managers work to rejuvenate wetlands all over the world, the degree to which these habitats return to natural conditions remains largely unknown. Part of this is due to the fact that the results of restoration are based largely on the standards it is measured against, and so choosing the appropriate basis for performance plays an enormous role in the apparent success of a project. A literature review and meta-analysis for restored coastal wetlands in the northern Gulf of Mexico identified reference parameters and standards for these restored sites.

www.cerf.science/cesn-may-2019#Article4

SEERS Spring Meeting Success!

SEERS met at UNC-Wilmington Center for Marine Science in Wilmington NC from March 7-9th. About 100 people came to share their knowledge about estuaries and network with old friends and new. Devon Eulie was our local host and is now our Secretary! Jess Whitehead of North Carolina Sea Grant gave the key note speech. She spoke about ecosystem resilience and incorporating multidisciplinary perspective.

Our new Student Representative, Mariko Polk

Mariko Polk is a Marine Biology PhD. student at the University of North Carolina Wilmington who was recently became the Student Representative for SEERS. Her research focuses on the application and

Mariko Polk

understanding of coastal ecology and management from a geospatial perspective. Her dissertation work focuses on analyzing human and ecological implications of estuarine shoreline stabilization decisions by examining the physical and biological impacts of natural, hardened (bulkheads and revetments), and living shorelines, and how applied shoreline management decision in North Carolina influenced socio-environmental issues after Hurricane Florence. In the field, she often performs biota and geomorphological coastal habitat assessments and has been able to incorporate advanced geospatial technology ranging from Real-time Kinematic (RTK)-GPS units to unmanned aerial systems (UAS) to terrestrial LIDAR. She seeks to promote coastal science through research, policy change, and education that empowers local communities, especially those that are underserved and underrepresented, in coastal management and resiliency. As the Student Representative, she hopes to strengthen student mentorship, collaboration, and inclusivity for undergraduate and graduate students in the SEERS region.

DISL's Our Wastewater Footprint: Water Quality Lessons from Local Estuaries

__Left:__ Toni Thomason and Elizabeth Hieb with The Sea Lab lead the Our Wastewater Footprint lesson with an interactive display at the University of Alabama Huntsville Science and Technology Open House held in Mobile at the Gulf Quest Museum. __Center:__ Our Wastewater Footprint team, Ashley Frith, Toni Thomason, and Kim Peter, lead the interactive display at The Sea Lab's annual open house, Discovery Day.__Right:__ The Our Wastewater Footprint team from The Sea Lab at Dauphin Island attends community events to share the lesson with all ages. These middle school students learn how we impact water quality during the University of Alabama Huntsville Science and Technology open house held in Mobile at the Gulf Quest Museum.

Our Wastewater Footprint is a product package developed from science to help communities work together to improve the quality of our coastal waters. More than four years of research led by Drs. Ruth H. Carmichael and Elizabeth Darrow helped to shape this unique resource that is accessible by everyone and can be modified and updated as needed for application to other watersheds.

The four years of research defined how human activities and land-use changes have affected water quality in the northcentral Gulf of Mexico, using the Grand Bay estuary and nearby waters on the Mississippi-Alabama coast as a representative system. In the Grand Bay system, like many coastal waters world-wide, nutrients and microbes in sediment, water, and shellfish reflected increasing wastewater inputs from sewage and stormwater. Most areas were in the early stages of change, but a highly urbanized area was impaired compared to other nearby waters. The data determined that where there were properly maintained and functioning wastewater treatment facilities, however, water quality was enhanced.

Based on stakeholder needs, Our Wastewater Footprint was born to include an interactive webpage[1], edutainment packet for communities (educational and fun!), and recommendations and resources to improve local water quality. Those resources include ways to report concerns, find data, and learn how to reduce your wastewater footprint.

"This is something that you affect every day, and our tools show how you can change your impact," said Toni Thomason, a Master's student at the University of South Alabama in the Marine Conservation and Resource Management program. "These products are a living resource, and we can adapt them to meet the needs of any local end user, groups, towns, or individuals. This is what makes Our Wastewater Footprint a unique tool."

Thomason is working with Dr. Carmichael and local non-profits, businesses, and ecotour groups to expand Our Wastewater Footprint resources and applications in the community. As part of her capstone project, Thomason will work with local organizations such as the Alabama Coastal Foundation, Dog River Clearwater Revival, WildNative Delta Tours, and Ecotours of South Mississippi to put these tools to use.

Currently, the materials are available for download[2] and use by the public. For more information, to ask questions, or to schedule a meeting with an Our Wastewater Footprint researcher, email wastewaterfootprint@disl.org.

Our Wastewater Footprint is a collaboration among the Dauphin Island Sea Lab, U.S. FDA, Gulf Coast Research Laboratory, Auburn University, University of North Carolina-Wilmington, and the Grand Bay National Estuarine Research Reserve (NERR). The project was funded by the NOAA NERRS Science Collaborative.

[1] https://www.disl.org/research/wastewaterfootprint
[2] www.disl.org/wastewaterfootprint

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Managing Your Data: Collaborating with Yourself and Others

Elizabeth Green, Rachael Blake, and Kelly Hondula
The National Socio-Environmental Synthesis Center (SESYNC), University of Maryland

There are many reasons to consider and anticipate sharing your data as a package (e.g. using the frictionless data standard[1] or as a research compendium[2]) from the very beginning of your research data process. Data sharing is improving and more journals now require it along with publications, but there are many competing standards and diverse practices across research fields/domains. Structuring your data and metadata as a package allows you to easily share with collaborators now and to publish your data later. Publishing your data also allows you to receive credit for your data contributions (Piwowar et al. 2007). A data package contains two equally important components, the data and the metadata. Neither is very useful without the other.

The first step in compiling a data package is formatting your data to be accessible to other people on your project, as well as to future researchers. Using a package structure, your accessible data is stored in non-proprietary and machine-readable file formats. For most tabular data, saving data as comma-separated values (CSV) files fulfills this criterion. However, for machine generated data or highly dimensional data[3], there may be other commonly accepted best practices for file formats.

With tabular data, the principals of Tidy Data[4] (Whickham 2014) lays out the best practices and advantages to structuring your data in a tidy format. In a "tidy" dataset each variable is a column and each observation is a row. The benefits of organizing your data in this format are it makes it easier to extract a single variable for analysis and ensures that variables remain paired throughout your analysis pipeline. Data in a "tidy" format is also easier to join to other datasets on a common variable, such as geography, date, or time.

Preparing data for sharing also includes standardization. For null values, leaving blank cells is the most universally recognized method and maximizes compatibility across software platforms. Dates should adhere to the ISO 8601 format of YYYY-MM-DD to eliminate the confusion created by trying to determine if 03-05-2019 is March 5, 2019 or May 3, 2019. Spelling, letter case, and white spaces should all be standardized, as a machine will see "Whale" as different from "whale" for example.

The second component to a data package is the metadata. Thorough metadata includes the information necessary for someone else to understand and use the data. (White et al. 2013). There are several specific metadata standards depending on what discipline your data are from, including the Ecological Metadata Language (EML)[5] and the Federal Geographic Data Committee (FGDC)[6]. Picking a metadata standard is informed by where you plan to archive and publish your data. Creating metadata can be a tedious exercise, but new tools are in development for translating between metadata standards.

Finally, you'll need to determine the appropriate place to archive your data package. Data repositories vary in their specificity of topics, requirements for submission, and level of curation.

You will want to pick a repository that hosts similar types of data and can ensure a certain permanence, so when someone comes across your research in five years, they can easily find your associated data. Although journal supplementary material is often a choice for publishing data, long term repositories are a better option because they specifically curate data files. Some repositories to consider include Dryad[7], Environmental Data Initiative (EDI) Data Portal[8], and the Qualitative Data Repository[9]. You can search for more data repositories from the Registry of Research Data Repositories[10].

With the goal of sharing a data package established at the beginning of your research data process, these resources and tips can help to streamline the process and allow for easier collaboration with colleagues, other researchers, and your future self. **If you want to learn more, check out SESYNC's CyberHelp[11] website where we share guides and lessons on different research data skills and answer frequently asked questions.**

[1] https://frictionlessdata.io/ [2] https://research-compendium.science/ [3] https://en.wikipedia.org/wiki/Hierarchical_Data_Format
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[8] https://portal.edirepository.org/nis/home.jsp [9] https://qdr.syr.edu/ [10] https://www.re3data.org/ [11] CyberHelp: https://cyberhelp.sesync.org/

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Strategies for Science

Doug Bell

Visiting the Mauna Loa Observatory, home of the Keeling Curve, currently maintained by the Global Monitoring Division of OAR's Earth System Research Laboratory.

Scientifically trained perspectives are an essential component for shaping informed decision-making in public policy. A testament to that idea is this year's 40th anniversary of Sea Grant's John A. Knauss Marine Policy Fellowship Program, having funded nearly 1,300 fellows since its inception[1].

A complete overview of the program can be found on Sea Grant's website, but in short, selected finalists—who are either current or recent graduate students with backgrounds in marine and/or environmental science, public policy, and law—are matched with host offices within the Executive and Legislative branches for a year-long fellowship to learn about, and contribute to, a range of policy, research, resource management, and/or administrative processes.

I was fortunate to be matched with the Office of Policy, Planning, and Evaluation (PPE) within NOAA's Office of Oceanic and Atmospheric Research (OAR). One of the key experiences I sought from the fellowship was to learn how management decisions are shaped within a scientific organization, an interest that was raised during previous tenures at research and academic institutions. With PPE, my core responsibilities focused on strategic planning, coordination, and laboratory evaluations. Another emphasis of the fellowship is for Fellows to step outside our immediate host offices for broader experience and professional development. Over the year, I sought out additional work experience with the National Sea Grant Office and OAR's Budget Formulation and Analysis Division, as well participating in several conferences and workshops.

Collectively, my experiences provided a holistic perspective of the operational mechanics of a federal enterprise, as well as its current challenges and the future strategies needed for its ongoing success. Whether it was in strategy discussions, budget considerations, or conference workshops around the country, several themes continued to emerge as foundational to the future application and management of scientific research: collaboration, coordination, and communication. Federally-funded research in the U.S. continues to be world-class, but thoughtful application and enhanced utility of technical knowledge requires strengthening collaborations between the natural sciences and the social, behavioral and economic sciences (SBES)[2]. Furthermore, integrating SBES into research programs may be utilized to demonstrate the value that federally-funded science provides the American public. And to fully enable effective collaboration, dedicated coordination across a broad range of stakeholders (e.g., federal agencies, state governments, public citizens, nonprofits, private industry, and academia) should not be overlooked. Lastly, strategic communication was consistently stressed as being vital for maintaining awareness and building support from both voters and decision-makers.

To me, the integration of all these activities formalized my understanding that when we speak of marine policy, we are implicitly referring to an incredible range of skillsets and roles that are required to inform and drive policy from an idealized conception to its practical implementation.

For student readers who have written text speaking to the relevance and broader impacts of their research but pause with uncertainty regarding the mechanisms of how their science is applied, consider exploring the environmental policy environment. There are many opportunities at the intersection of science and policy (AAAS S&T Policy Fellowship, Presidential Management Fellowship; NOAA Coastal Management and Digital Coast Fellowships), in addition to those mentioned in past issues of *CERF's Up!*[3,4].

I was also encouraged by another consistent message throughout the year, which was the importance of integrating the younger generation into the federal workforce. While both sides of the hiring equation have not found a satisfying equilibrium, opportunities are available, but it requires fine-tuning your employment radars. Regardless of where you are in your education, start looking at job postings. For those that excite you, learn the requirements and invest time in balancing your skillset and seeking relevant opportunities to obtain that experience. In a previous CERF's Up!3, Ben Wilson makes excellent suggestions for stepping outside the lab. In addition to those recommendations, consider auditing classes in economics and social sciences, engaging in public stakeholder gatherings on environmental topics of interest, and

Strategies for Science *(continued)*

certainly reviewing the workshops offered at the upcoming CERF Biennial. Networking should also not be restricted to conferences as I found my most meaningful interactions were initiated through "cold-call" emails and followed up over coffee or lunch. To graduate program administrators and current faculty, please take heed of the growing need and interest for diversified graduate experiences[5,6].

Truly, the Knauss Fellowship provided me an invaluable perspective of our broader scientific enterprise. It has also steered me to continue exploring the environmental policy realm, now as an ORISE Fellow with EPA where I will be working on the adoption and review of State and Tribal water quality standards.

**The thoughts expressed in this article are those of the author and do not represent the views or policies of the institutions aforementioned.*

[1] National Sea Grant College Program. 2019. Knauss Fellowship Fact Sheet. Retrieved from https://seagrant.noaa.gov/Knauss

[2] National Academies of Sciences, Engineering, and Medicine. 2018. Integrating Social and Behavioral Sciences Within the Weather Enterprise. Washington, DC: The National Academies Press. https://doi.org/10.17226/24865.

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[5] National Academies of Sciences, Engineering, and Medicine. 2018. Graduate STEM Education for the 21st Century. Washington, DC: The National Academies Press. https://doi.org/10.17226/25038.

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OFF-SITE WORKSHOP

Concepts and Controversies in Tidal Marsh Ecology Revisited

An inter-generational meeting of tidal marsh ecologists examining marsh support of fisheries

Join us for a 1.5-day workshop being held at the Dauphin Island Sea Lab on 2–3 November as part of the official CERF 2019 Conference Program.

Since the publication of Concepts and Controversies in Tidal Marsh Ecology (Weinstein & Kreeger 2000) much has been done to address the challenges posed by the authors therein, and advance the field of tidal marsh research. This meeting of tidal marsh ecologists will bring together ecologists from retired leaders to new grad students, to identify and discuss the key challenges facing these ecosystems into the 21st century. A combination of presentations, panel Q&A, and group discussions will facilitate the sharing of insights, knowledge, and advice from the old guard to the new. We will explore the central theme of marsh support of fisheries by discussing topics including habitat-fishery linkages, connectivity, seascapes, economic and social valuation, restoration, and climate change. This is a tremendous opportunity to network with and gain insights from leaders in this field.

We have confirmed Distinguished Professor Ken Able, Rutgers University, as our keynote speaker, together with our other special invited guests, leaders of the field over the past decades, including Rod Connolly, Carolyn Currin, Linda Deegan, Ron Kneib, Tom Minello, Lawrence Rozas, Si Simenstad, Gene Turner, and Mike Weinstein. Join us to gain insights from these leaders from their lifetime of work in this field.

Papers arising from the meeting, and relevant papers from the main CERF conference, can be submitted to a Special Issue of Estuaries and Coasts. Registration is limited to 50 participants. Register via the CERF 2019 conference website[1] or contact meeting hosts Ron Baker[2] at, or Matt Taylor[3] with any enquiries, and to discuss presentation or paper proposals. The meeting schedule allows for a limited number of submitted presentations to set the scene, and the hosts will be Editors of the Special Issue in Estuaries and Coasts.

[1] https://cerf.science/cerf-2019
[2] rbaker@disl.org
[3] matt.taylor@dpi.nsw.gov.au

CERF 2019: Registration is Open

Registration for CERF 2019 is open! You do not have to be a member to attend our conference; however, CERF members receive a discounted registration rate. The Biennial CERF Conference offers coastal and estuarine scientists from all over the world to come together for almost a full week to network, learn, attend intriguing sessions, and explore the interesting city of Mobile, Alabama, with new colleagues and friends.

Advance registration is available until 6 October. Make sure to register to save up to $80 on conference registration.

Check out pricing options and register now for #CERF2019 at www.cerf.science/2019-registration.

On-site Conference Workshops

Are you looking for a way to further enhance your CERF 2019 experience? Consider signing up for a workshop! We will be offering a diverse program of 11 workshops on Sunday, 3 November 2019, as an exciting kickoff to a great CERF conference. These workshops represent an opportunity to receive valuable training in topics ranging from effective communications to technical web-based software.

All workshops have a limit to the number of participants to ensure maximum interactions and discussions. We encourage you to sign up for a workshop when registering for the CERF conference and take advantage of a low-cost, high-quality training opportunity.

Check out the full list of available workshops at www.cerf.science/2019-workshops.

Plenary and Keynote Presenters

CERF is excited to announce the #CERF2019 Plenary and Keynote Presenters! Read about them below visit our website to learn more.

CERF 2019 Keynote Presentation: The Gulf: History, Wisdom, and Hope

Dr. Jack E. Davis

Jack E. Davis is a professor of history specializing in environmental history and sustainability studies and the Pulitzer Prize-winning author of The Gulf: The Making of an American Sea. Before joining the faculty at the University of Florida in 2003, he taught at the University of Alabama at Birmingham and Eckerd College, and in 2002 was a Fulbright scholar at the University of Jordan in Amman. Upon joining the faculty at the University of Florida, he founded the department's student journal, Alpata: A Journal of History. His Race Against Time: Culture and Separation in Natchez Since 1930 won the Charles S. Sydnor Prize for the best book in southern history published in 2001. His next book, An Everglades Providence: Marjory Stoneman Douglas and the American Environmental Century (2009), received a gold medal from the Florida Book Awards. In 2014, he was a fellow at the MacDowell Colony, where he worked on his latest book, The Gulf: The Making of an American Sea.

The New York Times Book Review called his book a "beautiful homage to a neglected sea." The Gulf was a New York Times Notable Book for 2017 and made several other "best of" lists for the year, including those of The Washington Post, NPR, Forbes, and the Tampa Bay Times. The Gulf was a finalist for the National Book Critics Circle Award for nonfiction and winner of the Kirkus Prize for nonfiction. With his former student Leslie Poole (UF PhD 2012), he is currently editing a new edition of Wild Heart of Florida, a collection of personal essays and poems about natural Florida. In January 2018, he signed a contract with the publisher of The Gulf, Liveright/W.W. Norton, to write a new book, employing the working title Bird of Paradox: How the Bald Eagle Saved the Soul of America.

Jack is now writing a book on the cultural and natural history of the bald eagle. He divides the seasons between two "villes": Gainesville, Florida, and Harrisville, New Hampshire.

Environmental Decision Making: How Can Natural and Social Scientists Contribute, and What Can They Expect?

Monday, 4 November | 3:00 – 4:30 PM

Jason Shogren, Ph.D., is Stroock Chair of Natural Resource Conservation and Management and Department Chair in Economics at the University of Wyoming, his alma mater. He studies the behavioral underpinnings of economic and environmental policy. Jason is a foreign member of the Royal Swedish Academy of Sciences, and served as professor to King Carl XVI Gustaf of Sweden. He worked with the Intergovernmental Panel on Climate Change and for the Council of Economic Advisers in the White House. In 2007, he was one of 2,000 scientists and researchers on the Intergovernmental Panel on Climate Change, which was awarded a Nobel Peace Prize for its research establishing a connection between human activity and global warming. He is a Fellow of the Association of Environmental & Resource Economists, the Agricultural & Applied Economics Association, and the Beijer Institute of Ecological Economics.

Elizabeth A. Albright, Ph.D., an Assistant Professor of the Practice of Environmental Science and Policy Methods at Duke University's Nicholas School of the Environment, engages in research focused on local-level resilience and community learning in response to extreme climatic events. Elizabeth is currently working on projects studying hurricane disasters in the Carolinas, floods in Colorado, and access to water infrastructure in Alabama. Of particular interest to Elizabeth is the intersection of extreme events, climate change adaptation, and environmental

Plenary and Keynote Presenters *(continued)*

justice. Funded by the National Science Foundation, her work in Colorado has been awarded the Paul A. Sabatier Award for Best Paper in Environmental Politics at the American Political Science Association annual meeting. She has published on response to extreme climatic events, the advocacy coalition framework, and stakeholder participation in state-level regulatory processes.

Osvel Hinojosa-Huerta, Ph.D., is the Director of the Coastal Solutions Fellowship Program at the Cornell Lab of Ornithology. Osvel received his doctorate in Wildlife and Fisheries Science from the University of Arizona. Since 1997, he has been working in conservation and research projects in northwestern Mexico, in particular in wetland areas of the Sonoran Desert. Osvel's recent activities include the evaluation and recovery of protected birds, the implementation of community-based restoration projects, and the creation of partnerships with governments and stakeholders for the conservation of nature. He has been leading the efforts to restore the Colorado River delta during the past 20 years, including the restoration of river flows and the facilitation of binational negotiations between Mexico and the U.S. for the Colorado River. In his current position, Osvel is working to develop capacity and cross-collaborative projects to protect threatened coastal habitats for communities and shorebirds along the Pacific Flyway from Mexico to Chile. Osvel has co-authored 32 research articles and book chapters. In 2009 he received the National Award for the Conservation of Wetlands in Mexico, in 2012 he received the Emerging Explorer Award from the National Geographic Society, and in 2014 he received the Sonoran Desert Conservation Award.

Coastal Science Outreach: Citizen Science and Communication

Wednesday, 6 November | 3:00 – 4:30 PM

Lauren Alexander Augustine, Ph.D., is the Executive Director for the Gulf Research Program. She is responsible for overseeing all aspects of management and use of the criminal settlement funds from the Deepwater Horizon disaster that were entrusted with the National Academies by the federal government. This includes fulfilling the vision, defining the strategic direction, and leading the development and implementation of this multi-dimensional, science-based program. Since her tenure at the National Academies began in 2002, Lauren has gained experience working in a variety of roles on a broad range of topics pertaining to water, natural disasters, and resilience. Prior to joining the Gulf Research Program in 2018, she served as Director of the Resilient America Program, which supports communities' efforts to build resilience to extreme events using science and diverse stakeholder engagement. In addition, she has formerly served as Country Director for the African Science Academy Development Initiative (ASADI), a decadal program that built scientific capacity in national academies across Africa; as Director of the Disasters Roundtable; and as a study director for the Water Science and Technology Board.

Outside of her work at the National Academies, Lauren has served on the World Economic Forum's Global Agenda Council on Risk and Resilience; was a member of the Advisory Board for the American Geophysical Union's Thriving Earth Exchange program; and was a juror for two resilience competitions, Rebuild by Design for recovery after Hurricane Sandy and Resilience by Design in San Francisco. She is also a NATO Expert for the Civil Protection Group. Lauren earned her B.S. in applied mathematics and systems engineering and her M.S. in environmental planning and policy from the University of Virginia, and her Ph.D. in an interdisciplinary program that combined physical hydrology, geomorphology, and ecology from Harvard University.

Emily Maung-Douglass, Ph.D., is an Oil Spill Science Extension Specialist at the Louisiana Sea Grant College Program of Louisiana State University. Emily received a doctorate in Marine Biosciences from the University of Delaware and holds degrees from Old Dominion University and University of Connecticut. Trained as a marine ecologist, she studied big picture questions using techniques from chemistry and ecotoxicology. During her schooling, she volunteered doing science outreach whenever possible and collected data for part of her dissertation through a citizen science project by partnering with the Delaware Center for the Inland Bays. After post-doctoral work as a visiting science fellow at Xiamen University in China,

she put her skills and experiences to use for Louisiana Sea Grant at LSU where she is an Oil Spill Extension & Outreach Specialist. Originally from Cleveland, OH, Emily grew up in coastal Virginia where her fascination with the ocean and environment blossomed. She and her husband Keith now enjoy exploring Louisiana with their dogs, cat, and two-year-old son, Luca.

Michael S. Wetz, Ph.D., is the Harte Research Institute Chair for Coastal Ecosystem Processes at Texas A&M University at Corpus Christi. Mike is a broadly trained marine scientist, with expertise in phytoplankton ecology and water quality studies. He strives to provide a sound scientific basis for stakeholder-led coastal restoration/management efforts. In recognition of these efforts, Mike has received several awards from local conservation entities, including CCA's "Conservationist of the Year" and the Coastal Bend Bays Foundation's "Higher Education Award". Mike led a volunteer water quality sampling program in Baffin Bay for four years. Results from that study are now guiding watershed restoration and protection efforts that are being coordinated by the Baffin Bay Stakeholder group, which he co-chairs. He is a member of the Nueces Estuary Advisory Council, a stakeholder group that is tasked with assessing the effectiveness of the water management strategies in the Nueces River Basin. Finally, Mike is a member of the Gulf of Mexico Alliance Water Resources team, which focuses on understanding and reducing water quality problems in the Gulf of Mexico region. He received a doctorate and masters in Oceanography from Oregon State University, and a B.S. from Coastal Carolina University.

UPCOMING EVENTS

CERF 2019 Conference	**3–7 November, 2019**
NALMS Symposium	**11 November, 2019**

Student and Early Career Networking Event

Monday, 4 November 7:00 - 9:00 PM

Renaissance River View Hotel

Students, early career individuals, and panelists from a range of career disciplines who would like to participate in the Career Networking Event, please indicate your interest when registering for CERF 2019. If you have already registered and did not sign up for the event, please send your name, institution, and career level to CERF19CareerNetworking@gmail.com.

Join us for this popular networking event! Converse with faculty, professionals, post-docs, and other students while enjoying complimentary pizza* and beverages! Gather valuable information on various career options and make professional connections that may lead to job opportunities and future collaborations.

Participants will have the opportunity to chat with panelists from various coastal and estuarine science and management positions. Each career panelist will be stationed at a table, where students and recent graduates will join them to talk and ask questions. Then, after a set amount of time, students and early career individuals will switch tables to interact with a new career panelist. This will allow for conversations with several people from varied career paths, as well as interactions with your fellow peers!

Students and early-career individuals: Be sure to keep your calendar clear for this event. We request that you sign up to attend when you complete your registration for the conference online. Make sure to prepare some questions and bring business cards! Stay tuned for a list of panelists who will be in attendance.

Mid/Later-career individuals: Please consider signing up to be a panelist at this event when you register for the conference. Share your knowledge of careers, agencies, and institutions with tomorrow's leaders of the coastal and estuarine science and management community.

Whether it is just for an evening function or for the duration of the conference, we encourage you to adopt the CERF tradition of volunteerism and commitment to education. Who knows, you may end up meeting a future collaborator in the process!

Hot Tip: BRING BUSINESS CARDS! (Ask your department if they will print these for you cost-free. And yes, even students can have business cards!).

Also, when someone hands you their business card, on the back write down a few tidbits of who they are and something memorable about them…that way you'll remember them months after the conference when you go through your business cards.

*There will be dairy-free and gluten-free food options. If you feel comfortable doing so, please send an email to CERF19CareerNetworking@gmail.com indicating any dietary restrictions so we can ensure that your needs are met.

Student/Early Career Travel Awards

The deadline to apply for Travel Awards is August 6

Thinking about attending CERF 2019? Need assistance with travel? Apply for a Student/Early Career Travel Award! CERF is providing travel grants to support student and early-career members attending and presenting at CERF 2019 in Mobile, Alabama. Students and early-career professionals in need of financial assistance to attend the 2019 conference may request travel support from CERF's William E. Odum/Scott Nixon Memorial Fund for Student Activities. Awards typically range from $150 to $300 per person. Students can use this award as leverage to gain additional support from their academic department or employer. More information is forthcoming. Please check the CERF website[1] for updates.

[1] www.cerf.science/cerf-2019

CERF 2019 Film Festival

CERF is pleased to announce that this year's meeting will include a film festival. Any member can submit a short video, and we encourage everyone to come to the film festival screening event during the November meeting in Mobile. Films should be six minutes or less and align with one of four categories: Research, Places, People, and Coastal Connections. Coastal Connections is a broad category that includes films addressing social or other topics highlighting a connection to the coast. One filmmaker from each category will win the prestigious CERF Film Festival Best in Category Award. This is a great opportunity to showcase your research or coastal system in a creative way. Now is the time to start planning and filming! Films can be submitted via www.wetransfer.com to Jace Tunnell[1] by 1 September 2019. Feel free to email film festival co-chairs, Jace or Cassie Gurbisz[2], with questions.

[1] jace.tunnell@austin.utexas.edu
[2] cbgurbisz@smcm.edu

Silent Auction

The CERF 2019 Silent Auction will raise funds for the CERF Odum/Nixon Fund to support CERF student participation and development activities. A variety of items will be on display and available for bidding, including original artwork, books, scientific instrumentation, crafted sea creatures, pottery, home decor, and CERF memorabilia donated by members. Join us for a good cause, and great deals on highly prized items!

How can I donate an item?
If you will be donating an item for the silent auction, you may indicate so on your conference registration form. If you would like to donate an item after you have completed your online registration, you may contact the CERF office for assistance in adding your item for donation.

You may also download and complete the CERF 2019 Silent Auction Donation form and return to Pat Reilly at cerfauction@gmail.com. Completed forms are due by Monday, 28 October. Any items donated after Monday, 21 October cannot be shipped to the site, and must be brought by the donor.

Download the form at www.cerf.science/2019-silent-auction.

When will the auction take place?
The auction will open at 8:00 PM on Sunday, 3 November and close at 6:00 PM on Wednesday, 8 November. All bids must be placed prior to the close of the auction.

How do I collect my winning bid?
Auction winners can pay for items in the conference registration area. Item pick-up begins 7:00 PM on Wednesday, 6 November. All payments must be received by 3:00 PM on Thursday, 7 November. If payment is not received at that time, items will automatically be awarded to the next highest bidder who will be immediately contacted. All items must be collected and transported by auction winners at the time of payment.

Experience Mobile in 2019

CERF is excited to offer a total of seven fun and educational field trip opportunities for attendees during the conference. Explore the culture, history, and incredible natural resources found in Mobile, Alabama, and nearby communities on the Gulf of Mexico coast.

Carnival Museum

Find out why Mobile is known as the City of Six Flags as you learn about the diverse cultures that have influenced this port city since it was founded in 1702. We will depart the Mobile Convention Center at 9:00 AM for a historic tour of downtown aboard one of Mobile's charming locally based trolleys.

History Museums

On the Forgotten History field trip, attendees will journey along the Dora Franklin Finley African-American Heritage Trail (DFFAAHT) to experience the struggles and triumphs steeped in Mobile's African-American history.

5 Rivers Delta

On this trip, we'll travel just outside Mobile to explore the Mobile-Tensaw Delta, nicknamed America's Amazon because it boasts some of the highest plant and animal biodiversity in the world.

NERR

Join us in exploring the Grand Bay National Estuarine Research Reserve (GBNERR) on a trip that's For the Birds! Enjoy a guided boat tour of the Grand Batture area; one of the best, but also most remote, birding spots along the Mississippi coast.

Dauphin Island

Transition to Island Time as you travel 40 miles south of Mobile to spend the day on Dauphin Island, Alabama. Spend the morning with DISL staff and scientists touring the lab's research facilities and visiting Discovery Hall, where DISL's educators promote marine conservation through hands-on learning.

Oyster Farming

On this field trip, follow oysters From Farm to Table as we highlight Alabama's oyster farming industry and natural oyster reefs.

USS Alabama

No trip to Mobile would be complete without a trip to the USS Alabama Battleship Memorial Park, where you can explore Mobile's ties to military history By Land and By Sea. Spend the morning exploring the ship, learning about its wartime history and the life of the 2,500 service men who lived onboard during World War II.

For full field trip details, timing, and ticket prices, head to https://www.cerf.science/2019-field-trips.

CERF 2019 Sponsorship Opportunities

The CERF Biennial Conference attracts a highly educated crowd. These attendees are often recognized as community leaders and have significant influence and purchasing power in a variety of niche markets.

Last year, more than 1,700 attendees came from 40 different US states and from 27 countries, bringing a wide range of experience, expertise, and backgrounds to the conference. Your sponsorship message will reach this active and engaged audience, as well as those ranging from students and researchers to federal and state agents!

We hope you will take a moment to consider sponsoring this exciting educational event. The sponsorship prospectus and sponsor/exhibitor sign-up are available on our website: https://www.cerf.science/2019-sponsor-exhibit.

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CERF Submits Public Comments on Proposed WOTUS Rule

CERF has joined with 11 other science societies to submit public comments on the proposed rule to revise the definition of "waters of the United States" (WOTUS) protected under the Clean Water Act. This proposed rule would replace the 2015 Clean Water Rule (2015 CWR), which has been proposed for repeal.

CERF and the 10 other societies strongly oppose the proposed Rule and the U.S. Environmental Protection Agency's and the U.S. Army Corps of Engineers' decision to re-write and rescind the science-based definitions contained in the 2015 CWR. The proposed Rule is not based on sound science or the best-available peer-reviewed information and will, as a result, exclude numerous waters and wetlands that directly affect the chemical, physical, and biological integrity of primary waters, making it impossible to achieve the objectives of the Clean Water Act. Of particular concern to CERF membership is the proposed rule requires a direct, permanent, constant, surface water flow between an area and navigable waters to qualify as Waters of the US. This would exclude areas now considered as Waters of the US, including many marshes and wetlands, and also bodies of water fed by groundwater discharge, including some headwater streams.

Read the full public comment[1]

[1] https://cerf.memberclicks.net/index.php?option=com_dailyplanetblog&view=entry&year=2019&month=05&day=28&id=66:cerf-submits-public-comments-on-proposed-wotus-rule

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