

CERF's Up!

Volume 52 • Number 1 • March 2026

CERF in Action: Seagrass Bubbles and Cownose Rays

AFS and CERF Submit Public Comments on WOTUS

Reflections on CERF 2025



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



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Front Cover: Gold Coast beach at sunset, Queensland, Australia Photo: Nathan Cowley

Back Cover: Great Blue Heron on dock at Sydney waterfront, Nova Scotia, Canada Photo: Jeffrey Eisen

Call for Cover Photos for *CERF's Up!*

Would you like to see your favorite estuary displayed on the cover of *CERF's Up!*? If so, send high-resolution shots showing the place's natural beauty, along with a short caption and photo credit, to bulletin@cerf.science.

President's Message



Sharon Herzka
CERF President

How can we, as a leading society in coastal and estuarine science and management, with membership from many sectors and disciplines, maximize our impact on advancing research, knowledge, and stewardship in accordance with our mission? This question has been the focus of CERF's Governing Board over time. Since CERF was founded in 1971, multiple strategies have been developed and implemented with the unwavering support of a volunteer fleet that has generously shared its expertise and time. We must adapt to an evolving scientific and policy environment.

One way to leverage our capacity is to actively participate in policy and advocacy. In *Visions V*, the 2023–2026 CERF strategic plan, one of the three main goals is to “advocate for estuaries and coasts.” Specifically, this strategic goal addresses the challenges and opportunities of global coastal and estuarine ecosystems by advocating the use of sound science in policy and management. Under Linda Blum's presidency, the Policy and Advocacy Committee – Scott Martindale (chair), Don Boesch, Ryann Rossi, Frank Reilly, Tom Bigford, Cassandra Glaspie, Julio Lorda, and Julie Walker – was tasked with developing activities to advance CERF's mission of translating science into policy and management. As stated by the committee, “CERF should turn to a practice known as knowledge brokering to effectively influence policymakers and other decision makers. Knowledge brokering is a set of best practices designed to facilitate the uptake and use of science in policy and management

decision-making. Knowledge brokering was formalized as a concept about 20 years ago; it is a recognition that one-way communication—where scientists simply present their work to policy makers—is inadequate and ineffective. Thus, knowledge brokering emphasizes the importance of dynamic, interactive relationships and engagement between scientists and policy makers.”

The committee's insight into the need to incorporate knowledge brokering into CERF's policy and advocacy activities implies that we must provide our members with opportunities to develop the necessary skills. This includes relationship-building and networking; establishing credibility and maintaining neutrality; synthesizing data and knowledge; communicating effectively (including scientific limitations and uncertainty); applying mechanisms for knowledge co-production; understanding the cultural, institutional, and political context in which decisions are made; assessing impact; and strategic thinking.

While workshops, webinars, and other CERF activities have provided some of this training, we must broaden our skill-building efforts across the federation's activities. We need experienced knowledge brokers among you to help us train our members, especially students and early-career professionals who will be positioned to have an impact in the long term.

Early in 2025, Linda Blum established a Policy and Advocacy Rapid Response Task Force to address members' concerns about policies from the current US administration that affect coastal and estuarine

science and management, as well as the scientific enterprise as a whole. The Task Force advised CERF's Executive Committee on opportunities to support or collaborate on initiatives and communications led by partner organizations, including the American Institute of Biological Sciences, the Society of Environmental Toxicology and Chemistry, and the American Geophysical Union. CERF signed on to letters to the US Congress on protecting US science and the federal science workforce, expressing concern about the “[Improving Oversight of Federal Grantmaking](#)”¹ Executive Order, and urging Congress to support policies that protect environmental and public health. These statements are available on the CERF [Policy and Advocacy website](#).² This strategy enabled nimble, responsive action and leveraged the commendable efforts of partner organizations. The Task Force also organized a well-attended collaboration session on Capitol Hill policy and advocacy training at the 2025 biennial conference in Richmond.

CERF recently teamed up with the American Fisheries Society (AFS) to submit public comments in response to the proposed rule, “Updated Definition of ‘Waters of the United States,’” which was published in the *Federal Register* on 20 November 2025. Briefly, the proposed rule would erode water quality protections for wetlands that were established under the 1972 Clean Water Act, facilitate permitting for the filling and dredging of wetlands, and reduce mitigation requirements (see the [EPA WOTUS site](#)³ for more information). As CERF members are well aware, freshwater

and coastal wetlands deliver vital ecosystem services, including habitat and connectivity for economically and ecologically important species, natural water filtration, nutrient cycle regulation, blue carbon storage, and protection from storm surge and flooding, among others. The [comments](#)⁴ submitted by AFS and CERF provided the scientific and policy rationale for regulating the quality of water that feeds and sustains wetlands. You can read more about these comments on page 3.

We must continue to advocate for estuaries and coasts by sending letters to the US Congress and the executive branch, meeting with lawmakers, issuing public statements, and submitting public comments on proposed regulations. CERF, through the ample expertise of its members, is exceptionally well-positioned to do so. Please let us know if you are willing to participate in these efforts. We will also reach out based on members' expertise and the expressions of interest in volunteering we have received.

More proactive and forward-looking action is also needed. CERF members are "on the ground." We need your help identifying relevant issues for CERF to address. I encourage you to message me or Susan Park, our Executive Director, if you identify any issues important for CERF to address.

1. <https://bit.ly/grantmakingEO>
2. <https://www.cerf.science/policy-advocacy>
3. <https://www.epa.gov/wotus/updated-definition-waters-united-states>
4. <https://bit.ly/2025WOTUSComments>

CERF IN ACTION

Seagrass Bubbles as Ecosystem Indicators

Megan S. Ballard

Applied Research Laboratories, The University of Texas at Austin, Austin, Texas, USA



Aerial photograph showing the interdisciplinary team working to collect acoustic measurements and seagrass biomass samples in the East Flat seagrass meadow in Corpus Christi Bay

Photo: Kyle Capistrant-Fossa

Acoustic monitoring is revealing surprising new insights into the productivity of Texas seagrass meadows. In a new study, Ballard et al. use long-term acoustic observations to quantify oxygen ebullition from the sound of bubbles released during intense photosynthesis and show that this often-overlooked process can dramatically increase estimates of net ecosystem productivity. Comparing two contrasting meadows, the team found that shallow, *Thalassia*-dominated East Flats routinely experienced supersaturation and high bubble production,

tripling productivity relative to dissolved-oxygen methods alone. These results highlight the importance of accounting for ebullition and demonstrate the power of acoustics for remote ecosystem monitoring.

Reference

Ballard, M.S., K.A. Capistrant-Fossa, K.M. Lee, et al. 2026. Acoustic Monitoring of Two Seagrass Meadows Reveals Differences in Oxygen Ebullition and Biomass. *Estuaries and Coasts* 49: 46. <https://doi.org/10.1007/s12237-025-01655-5> <https://rdcu.be/e2JqB>

Digging Into Cownose Ray Foraging Disturbance and Its Impact on Seagrass Meadow Landscapes

Mickie R. Edwards

Batten School of Coastal & Marine Sciences and Virginia Institute of Marine Science, William & Mary, Gloucester Point, Virginia, USA

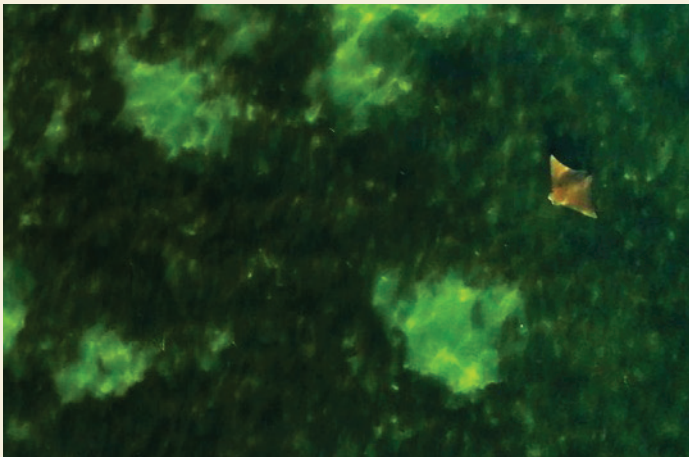


Fig. 1 A cownose ray swimming over an eelgrass meadow in the lower Chesapeake Bay, Virginia, USA Photo: Mickie R. Edwards



Fig. 2 A cownose ray foraging pit found in an area of largescale meadow fragmentation Photo: Mickie R. Edwards

Chesapeake Bay seagrass meadows are vital foraging grounds for migratory cownose rays (*Rhinoptera bonasus*; Fig. 1). While ray excavation can trigger meadow decline (Fig. 2), their long co-evolution suggests a more complex relationship.

Drone surveys (2024–2025) revealed that foraging intensity determines impact: concentrated digging

causes significant seagrass decline, whereas moderate, dispersed foraging does not. These findings indicate that while intense ray foraging is a serious stressor, resilient meadows can withstand, and may even be shaped by, diffuse bioturbation. Research continues into the holistic ecological role rays play in these habitats beyond simple disturbance agents.

AFS and CERF Submit Public Comments on WOTUS

CERF joined the American Fisheries Society (AFS) to [submit public comments](#)¹ outlining concerns with the proposed rule “[Updated Definition of ‘Waters of the United States,’](#)”² issued by the US Army Corps of Engineers and the US Environmental Protection Agency in the *Federal Register* on 20 November 2025. In 2023, the US Supreme Court decided in *Sackett v. EPA* that “Waters of the US” (WOTUS) regulated under the Clean Water Act (CWA) must be “relatively permanent” and have a “continuous surface connection” with traditional navigable waters, potentially removing approximately

two-thirds of the nation’s remaining wetlands and up to 5 million miles of streams from protection. In the public comments, CERF and AFS argue the proposed rule further erodes these protections by imposing new and confusing standards that restrict protections in a manner not required by *Sackett* and in contradiction with the science and the purpose of the CWA. For example, the proposed rule defines “relatively permanent” to mean “standing or continuously flowing bodies of surface water that are standing or continuously flowing year-round or at least during the wet season” without clearly defining wet

season, thus adding confusion and potentially removing from protection waters with unpredictable or non-seasonal connections (such as some ephemeral streams). The 45-day public comment period closed on 5 January 2026; the final rule is expected to take effect later this year. You can read the full comments and all previous CERF comments and statements on WOTUS on the [Policy & Advocacy website](#).³

1. <https://bit.ly/2025WOTUSComments>
2. <https://www.epa.gov/wotus/updated-definition-waters-united-states>
3. <https://www.cerf.science/policy-advocacy>

Volunteer Thank You

We would like to thank the more than 250 members that served CERF as a volunteer between the 2023 and 2025 Biennial Conferences. With a small staff, the work of CERF could not get done without its volunteers. The people listed below ensured CERF programs were implemented, publications were produced, new initiatives developed and created, and progress was made on our strategic plan — all in service to our members and the broader coastal and estuarine science and management

Peter Adams	Henrique Cabral	Anne Giblin	Reese Kober	Raymond Najjar	Joe Reustle	Spencer Tassone
Sohaib Alahmed	John Callaway	David Gillett	Narayan Kumar	Massa Nakaoka	Gabriela Reyes	Corianne Tatariv
Meryl Alber	Kyle Capistrant-	Rachel Gittman	Jessica Lacy	James Nelson	Jacqueline Richard	Matt Taylor
Alia Al-Haj	Fossa	Cassandra Glaspie	Scott Lerberg	Nicholas Nidzicko	Aaron Ridall	Dave Tomasko
Mike Allen	Joe Carlin	Enrique González-	Angela Levis	Elizabeth North	Brian Roberts	Trevyn Toone
Mead Allison	Caldonia Carmello	Ortegón	Kris Lewis	Autumn Oczkowski	Carlos Rocha	Brooke Torjman
Lillian Aoki	Ruth Carmichael	Judith Grassle	Chanda Littles	Jim O'Donnell	Ivan Rodil	Stacy Trackenberg
Stephanie Archer	John Carroll	Treda Grayson	Steve Litvin	Ron Oleynik	Charles Roman	Tiffany Troxler
Anna Armitage	Just Cebrian	Holly Greening	Hongbin Liu	Jill Olin	Kaitlin	Arnoldo Valle-
Cassandra	Vikki Chanse	Kristin Grimes	Zhanfei Liu	Geno Olmi	Rommelfanger	Levinson
Armstrong	Wen-Chen Chou	Julia Guimond	Mariah Livernois	Robert Orth	Alfonsina Romo	Jamie Vaudrey
Amanda Babson	Robert Christian	Stephen Hale	Paola López-	David Osgood	Curiel	Eric Wade
Lesley Baggett	Jenna Clark	Leila Hamdan	Duarte	Mike Osland	Kenny Rose	Jan Walker
Ronald Baker	Jeff Clements	Angelos Hanides	Sara Loquist	Tia Ouyang	Lauren Ross	Julie Walker
Elisa Baldrighi	Andrea Copping	Amber Hardison	Julio Lorda	Gulnihal Ozbay	Ryann Rossi	Nathan Waltham
Gracie Ballou	Kimberly Cressman	Lora Harris	Catherine Lovelock	Hans Paerl	Jamila Roth	Benjamin Walther
Brian Barnes	Kelly Darnell	Ken Heck	Jim Lovvorn	Cindy Palinkas	Roberto Rovira	Faming Wang
Savanna Barry	Zack Darnell	Enie Hensel	Alfonso Macias-	Terry Palmer	John Rybczyk	Wen-Xiong Wang
Joy Bartholomew	Theresa Davenport	Valeria Hernandez	Tapia	Joanna Parkman	Elizabeth Salewski	Scott Warren
Marcos Bartoli	Kim de Mutsert	Talavera	Chris Madden	Erin Peck	Gabrielle Saluta	Jes Watts
Marcus Beck	Linda Deegan	Sharon Herzka	Robert Magill	Xuefeng Peng	Denise Sanger	Carolyn Weaver
Krystle Bell	Ester Dias	Victoria Hill	Veronica Malabanan	Danielle Perry	Nina Sassano	Judy Weis
Veronica Berounsky	Jiabi Du	Joel Hoffman	Lucchese	Mark Peterson	Courtney Schmidt	Michael Wetz
Alice Besterman	Brett Dumbauld	Lijun Hou	Monica Maldonado	Anna Pfeiffer-Hebert	Brian Scott	Dennis Whigham
Matt Bethel	Ken Dunton	Bob Howarth	Mike Mallin	Jay Pinckney	Tracie Sempier	Justine Whitaker
Tom Bigford	Allie Durdall	Randall Hughes	Mario Marquez	Mariko Polk	Zoë Shribman	Christine Whitcraft
Alexandra Bijak	Meagan Eagle	Carles Ibáñez	Charles Martin	Jennifer Pollack	Eduardo Siegle	Serina Wittingham
Donna Marie	Kyle Emery	Alexis Jackson	Scott Martindale	Abby Powell	Michael Sievers	Melisa Wong
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Kevin Boswell	Dan Friess	Sarah McGuire Nuss	Sarah McGuire Nuss	Johnny Quispe	Alina Spera	Mollie Yacano
Walter Boynton	Richard Fulford	Hamed Moftakhari	Hamed Moftakhari	Gina Ralph	Alice Staro	Briana Yancy
Anna Braswell	Neil Ganju	Paul Montagna	Paul Montagna	David Ralston	Sommer Starr	Erik Yando
Mark Brush	Aurora Gaona	Pedro Morais	Pedro Morais	Patricia Ramey-Balci	Jason Stutes	Qian Zhang
Robert Buchsbaum	Hernandez	Fredrika Moser	Fredrika Moser	Zlatka Rebolledo	Lori Sutter	Stacy Zhang
Ashley Bulseco	Kylea Garces	Thomas Mozder	Thomas Mozder	Sánchez	Martha Sutula	Jennifer Zhu
Maya Burke	Nathan Gerald	Margaret Mulholland	Margaret Mulholland	Erin Reilly	Dennis Swaney	Richard Zimmerman
Isabel Butler Viruet	Guillermo Giannico	Tiffany Ko	Mike Murrell	Frank Reilly	Drew Talley	

community. These included volunteers organizing the CERF Conference; serving as editors for *Estuaries and Coasts*, *Coastal and Estuarine Science News*, and *CERF's Up!*; and serving on the Governing Board and CERF committees. Many volunteers served in multiple roles or on multiple committees. If you wish to serve on a committee, please reach out to CERF Executive Director Susan Park (spark@cerf.science). Thank you for your service!

2025 Legacy Fund Scholarship Recipient: Anamika Das Kona



Anamika Das Kona is the recipient of the 2025 CERF Legacy Fund Scholarship. Anamika is currently

working toward her master's degree under Dr. Victoria Hill in the Department of Ocean and Earth Sciences at Old Dominion University. Hill's lab focuses on how light interacts with

marine ecosystems, with investigations spanning marine vegetation, blue carbon stocks, and overall water quality.

Anamika has been studying the effect of changing water temperature and salinity on seagrass, an estuarine keystone species and critical habitat for blue crab. She seeks to understand strategies that can protect and strengthen estuarine ecosystems, which represent a vital cultural and economic center of her native Bangladesh.

The scholarship review committee noted that in addition to presenting a well-articulated account of her research, Anamika chose to apply her scholarship funds to attend a National Environmental Policy Act training seminar. She has a track record of extending her training beyond the classroom and lab, and she clearly demonstrated how environmental policy will play a pivotal role in her growth as an ecological steward.

In Memoriam: James Cloern

Hans Paerl¹, Jane Caffrey², and Wim Kimmerer³

1. University of North Carolina at Chapel Hill, Institute of Marine Sciences, Morehead City, North Carolina, USA

2. University of West Florida, Pensacola, Florida, USA

3. Estuary & Ocean Science Center, San Francisco State University, Tiburon, California, USA



With heavy hearts we announce that our dear friend and colleague Dr. James E. "Jim" Cloern, who was a US Geological Survey (USGS) scientist for 49 years, died on 3 November 2025. Throughout Jim's career in estuarine and coastal science, he set a standard of scientific excellence, innovation, dedication, and personal engagement to all the CERF community. Jim's curiosity led him to identify key questions fundamental to aquatic science, then insightfully interpret the data collected to address them. His nearly two hundred published contributions demonstrate care in design of field work, scientific rigor, brilliance in interpretation, clarity of thought and analysis, and a stellar ability to communicate.

Jim was well known for his tenacious stewardship of a long-term monitoring program in San Francisco Estuary, a nearly six-decade program he leveraged into ground-breaking research and synthesis with global datasets. Globally, he earned the respect and deep personal friendship

of countless colleagues, coworkers, mentees, and stakeholders. During his productive and innovative career, examples abound of his novel ideas and paradigm-setting contributions to the field. Jim revolutionized our conceptual models of how estuaries "work" and are influenced by external and internal forcing, ranging from upstream freshwater supplies to exchanges with the coastal ocean as well as the links to climate change. Works such as his 2001 re-evaluation of coastal eutrophication or his more recent 2012 synthesis examining phenology of phytoplankton biomass have had tremendous impact on our understanding of coastal dynamics. The intellectual creativity, critical thinking, and insightfulness Jim brought to his work and shared with his colleagues, students, technicians, stakeholders, and managers benefited CERF and other scientific communities such as the Association for the Sciences of Limnology and Oceanography (ASLO), American Association for the Advancement of Science, American Geophysical Union (AGU), Ecological Society of America (ESA), and North American Lake Management Society.

The evidence of Jim's national and global respect and impact lies in his many awards, distinctions, and invitations. The Woods Hole Oceanographic Institution gave him its prestigious Ketchum Award. CERF bestowed upon him the Odum Lifetime Achievement Award. ASLO gave Jim the Ruth Patrick Award for career excellence in applying basic science to important environmental problems. Jim was an elected fellow of both ASLO and AGU. Regionally, he was a recipient of the Delta

Science Program's Brown-Nichols Award for outstanding contributions to science in the San Francisco Estuary and Watershed. His stature, leadership, and willingness to shoulder major professional responsibilities were evident in the sessions he organized for prestigious meetings and the invitations for an uncountable variety and number of talks, workshops, technical advisory panels, and review panels, locally, nationally, and internationally. Whether he was testifying to Congress on the importance of long-term monitoring or curating journal articles, Jim brought his commitment and enjoyment of estuarine and coastal science forward with unmatched enthusiasm.

He was a strong believer in helping early-career scientists write coherent papers and in robust peer review, manifested in his roles as co-editor in chief of *Estuaries and Coasts* (2007–2012) and, since 2019, editor in chief of *Limnology and Oceanography (L&O) Letters*. He often said his work with young people in the latter role was a highlight of his retirement. To honor Jim's legacy of mentoring early career scientists in the art and science of writing and editing, the ASLO Board of Directors is renaming the *L&O Letters* Early Career Publication Honor in his name. The James E. Cloern Early Career Publication Honor will focus on the publication of innovative aquatic science research by early-career researchers.

Jim was the son of a United States Marine and, as many other children of military parents, he experienced many moves in his childhood. He conveyed that his childhood reflected parts of the 1979 film *The Great Santini*—a wild ride. His family

lived in several places as he grew up, but he called Wisconsin home. That was where he met his wife Linda and obtained his Bachelor of Science at the University of Wisconsin Madison. His PhD was from Washington State University, where his studies combined mathematical modeling with data he and Linda collected from a small lake. He was hired by the USGS in 1976 as a “modeler” for the developing San Francisco Bay Project. As soon as he arrived in Menlo Park, however, he was also asked to design and execute a water quality monitoring program across the entire San Francisco Estuary. Using the estuary as a natural research laboratory, he and two similarly “green” colleagues (Brian Cole and Andrea Alpine), built a team of talented colleagues, students, post-docs, and collaborators from around the world that carried forward a now-legendary 57-year-long water quality monitoring and research program. Jim had a huge positive impact on resource management and governance of the San Francisco Estuary (SFE) that reflects his dedication, influence, and collaborations.

Focused studies were often punctuated by syntheses, including papers comparing drivers of productivity and eutrophication using data from global estuarine and coastal ecosystems. Important reviews included the classic 1996 discussion of coastal phytoplankton blooms in *Reviews of Geophysics* and the 2006 special issue of *Limnology and*

Oceanography on eutrophication that he organized and edited. The comparative syntheses are key items on estuarine and coastal scientists’ and students’ “bookshelves” and have served to better understand how anthropogenic and climatic changes are impacting the states and changes of our valuable estuarine ecosystems.

The scope of Jim’s published output is astonishingly broad, and we mention only a few highlights. Early papers focused on phytoplankton in the SFE using data gathered during the long-term monitoring program he started. His first publication on the estuary (1979) showed marked spatial variation in responses to environmental drivers among phytoplankton assemblages in the SFE. As his career progressed, Jim collaborated with scientists of a variety of disciplines including hydrodynamics, water chemistry, climate, and ecology of benthos, zooplankton, and fish. A paper in 1992 with his USGS colleague Andrea Alpine showed that a recently introduced clam (*Potamocorbula amurensis*) had erased the phytoplankton blooms that had persisted during low-flow summers. Subsequent papers with several collaborators explored the role of vertical mixing in modulating the consumption of phytoplankton by bivalves, and how this grazing fell most heavily on the larger cells. Jim’s 2001 paper on coastal eutrophication (cited over 3,000 times) explored key differences between

the responsiveness of lakes to a reduction in nutrient inputs and the weak and system-specific responses of most estuaries, a theme he returned to in one of his final papers (2025). Throughout his career, Jim’s papers became broader and more synthetic, using comparisons among estuaries and freshwater bodies to discern key driving factors and improve understanding. They are also paragons of clear thought and clear writing.

Although Jim was a towering estuarine scientist, he was equally a gem of a human being. Great happiness came from his family, which was the center of his life. He was filled with joy and wonder from time spent with his children and then his grandchildren. Science was important, but so were the people he worked with and their families, health, lives, and friendships with him and each other. Dinners, holiday parties, baseball games, oyster roasts, wild sailing adventures, many happy hours, and other traditions were memorable. He once said to a friend, “no one deserves to have had as much fun in life as we did.” Jim set a formidable example of how to be a stellar scientist without sacrificing his integrity, humanity, humility, generosity, and wonderful sense of humor. Jim’s family and his many friends, colleagues, and mentees around the world miss him dearly.



In Memoriam: Danielle Kreeger



We are deeply saddened to share that Danielle Kreeger passed away on 30 December, leaving a lasting legacy within the Coastal and Estuarine Research Federation (CERF), the Atlantic Estuarine Research Society (AERS), and the broader coastal science and management community.

Danielle was many things in life—a parent, wife, family member, friend, scientist, teacher, mentor, black belt in karate, surfer, collector, and much more. Danielle’s professional career reflected a lifelong dedication to estuarine and coastal ecosystems, shellfish ecology, and nature-based solutions and well-rounded experience in research, teaching, and

environmental management. For more than 30 years, she studied the biology and ecosystem services of freshwater and saltwater habitats, including mussel beds and oyster reefs, to promote resilience to climate change in places such as Delaware Bay. Danielle received her PhD in 1992 from the Oregon State University Hatfield Marine Science Center. She served for many years as a senior scientist and science director at the Partnership for the Delaware Estuary and held academic and research appointments at Bryn Mawr College, the Academy of Natural Sciences of Drexel University, and the Haskin Shellfish Research Lab at Rutgers University. Across these roles, she was known for her ability to connect science with real-world restoration and management needs, and for doing so with clarity, integrity, and care.

Danielle was a long-standing and dedicated CERF member and served on the CERF Governing Board, where her thoughtful leadership and commitment to estuarine science helped advance the federation’s mission to foster research, stewardship, and professional development across disciplines and regions. In her contributions to CERF, she exemplified the collaborative spirit that underpins the federation’s work

in connecting science, policy, and practice. In addition to her service at the CERF level, Danielle was deeply involved in AERS. She held multiple leadership roles in AERS, including President and Historian, guiding the Society through its 70th anniversary and helping preserve its rich history. In recognition of her sustained and impactful service, she was honored as a recipient of the Venerable Clam, one of the society’s highest distinctions.

Across both CERF and AERS, Danielle was known for her mentorship of students and early-career professionals, her advocacy for science that informs management and restoration, and her unwavering dedication to community building. Danielle is survived by her family and a wide community of colleagues, collaborators, and former students who benefited from her intellect, kindness, and leadership. Her legacy will live on through the societies she helped steward so thoughtfully and the many lives she touched along the way. She will be missed deeply by the AERS and CERF communities. A memorial honoring Danielle’s life and contributions can be found [here](https://www.legacy.com/us/obituaries/name/danielle-kreeger-obituary?id=60482359)¹.

1. <https://www.legacy.com/us/obituaries/name/danielle-kreeger-obituary?id=60482359>



Reflections on CERF 2025

Thank you for attending the 28th Biennial CERF Conference 9–13 November 2025, in Richmond, Virginia, USA. Despite all the challenges and uncertainty, we were thrilled to have more than 1,000 presentations and 1,450 attendees. This was the first CERF conference for more than half the attendees, but we hope it will not be the last. Many thanks to all the volunteers, presenters, sponsors, exhibitors, staff, and attendees for making CERF 2025 such a success! You can still review the [program](#)¹ and peruse the [photo album](#)² and opening ceremony, keynote, and plenary [recordings](#)³ to relive the fun times and valuable learning and networking opportunities. We look forward to seeing you in San Juan, Puerto Rico, 7–11 November 2027 for the 29th biennial conference!

1. <https://www.xcdsystem.com/cerf/program/Ahev5CR/>

2. <https://bit.ly/CERF2025Photos>

3. <https://bit.ly/CERF2025Recordings>



Student Presentation Award Recipients

Congratulations to all the 2025 student presentation award recipients! Awards were given to the top presenters in each of the following categories:

Undergraduate Traditional Oral Presentation

Keksi Geurts: Long-term characterization of European green crab, *Carcinus maenas*, monitoring in coastal Alaska

Eve Smerczynski: Four decades of change in the copepod community of North Inlet Estuary, SC

Lucille Yoes: Investigating benthic communities amongst the Northern Gulf of Mexico's hypoxic dead zone

Undergraduate Lightning Oral Presentation

Cole Johnston: Resource partitioning between co-occurring sea turtle species using stable isotopes

Khanyisile Nomsa Tshabalala: Effects of short-term storage conditions on *Ruppia maritima* seed viability and germination for large-scale restoration

Undergraduate Poster Presentation

Ariel Mahana Mercurio: Effects of meadow type on *Zostera marina* seed bank structure and function

Max Monks: Investigating genotype level variation in *Phragmites australis* seed germination under global change

Madison Wray: The LENS project: Transparent data for calculating the biomass of Louisiana nekton

Graduate Traditional Oral Presentation

Mya Anita Darsan: Exploring fungal-*Spartina* interactions along an elevation gradient to inform carbon dynamics in salt marshes

Zahra Hasan: Characterizing cyanobacterial mats on damaged wind-tidal flats in Boca Chica, Texas

Sarai A. Hutchinson: Incorporating novel approaches in mangrove restoration: using *Sargassum* and recycled crushed glass

Clara Stanbury: Waves and tides drive landward transport and deposition of organic-rich sediment on an intertidal flat

Graduate Lightning Oral Presentation

Sophia Carmen Corde: What gets reported? A novel method for quantifying bias in community-sourced data

Hailee G. Nigro: Interactions and tradeoffs between habitat preferences and thermal preferences in juvenile blue crabs

Alexa Putillo: Diet selection of sympatric sea turtles in Florida's Gulf Coast

Graduate Poster Presentation

Ansley Levine: Convergence or submergence: Variable emergent plant communities across restored salt marsh islands on decadal timescales

Paul Atter Okrah: Modeling subsurface thermal and salinity dynamics in a southeastern US salt marsh

Ria Salway: Characterizing ploidy-specific physiological responses of oyster seed to high temperature and ocean acidification stressors

National University of Singapore Wins Student Coastal Design Competition



The National University of Singapore is the first-place winner of the 2025 CERF Student Coastal Design Competition.¹ Three expert judges selected their design “Cultivating Resilience” among the five teams as the top project addressing resilience

challenges and opportunities facing the community of Galesville, Maryland, USA. The design was developed by undergraduate students from the Department of Architecture in the College of Design and Engineering — Lina Altoaimi, Vedika

Gupta, Kaena Sutanu, Lee Wen Qi Sherly, Toh Tze Hwee Chloe, Ho Qian Yu, Seah Yun Zhang Deston — guided by faculty advisors Dr. Rosita Samsudin and Dr. Terrence Tan Chun Liang.



An example of a design solution proposed by the National University of Singapore Team entitled “cultivating a culture of play and curiosity”

Credit: Lina Altoaimi, Vedika Gupta, Kaena Sutanu, Lee Wen Qi Sherly, Toh Tze Hwee Chloe, Ho Qian Yu, and Seah Yun Zhang Deston

1. <https://conference.cerf.science/coastal-design-competition>

The CERF Student Coastal Design Competition is a forward-facing initiative to inspire students and faculty across disciplines to work together in proposing innovative design solutions and strategies to make our coastal environment more resilient in the face of coastal impacts of climate change. It is a way for CERF to collaborate with local communities to solve pressing challenges. It aims to bring together coastal science with other disciplines to address challenges associated with climate change through design. Faculty-led, transdisciplinary teams of students work together to solve coastal problems such as erosion, storm-water management, and community infrastructure as well as respond to climate change at the site. The

(continued on page 12)

2025 CERF Student Coastal Design Competition Teams

First Place

National University of Singapore, Department of Architecture, College of Design and Engineering. “Cultivating Resilience.” *Students:* Lina Altoaimi, Vedika Gupta, Kaena Sutanu, Lee Wen Qi Sherly, Toh Tze Hwee Chloe, Ho Qian Yu, Seah Yun Zhang Deston. *Faculty Advisors:* Rosita Samsudin, Terrence Tan Chun Liang

Second Place

Anne Arundel Community College and University of Maryland Center for Environmental Science. “Village Vitality: Strengthening Community Through Connection.” *Students:*

Alex Bradford, Effie Gentry, Jordan Goodyear, Devin Landry, Emily Price, Julia Smeltzer, Danielle Staggers, Danai Hynson. *Faculty advisors:* K. Halimeda Kilbourne, Javier Lloret, Lorie Staver, Lora Harris, Robert Lowe

Third Place

University of Washington, Tacoma. “STREAM - Students Tackling Resilience in Erosion, Aquatics, and Marine Systems.” *Students:* Refaa Aziz, Damien Bradley, Jovanny Calderon, Liliana Fuentes, Raeya Marostica, Brandon Myers, Robert Pellegrino, Derek Perez Gomez, Elizabeth Reynolds, Dennis Wanjiku. *Faculty Advisors:* Heather Dillon,

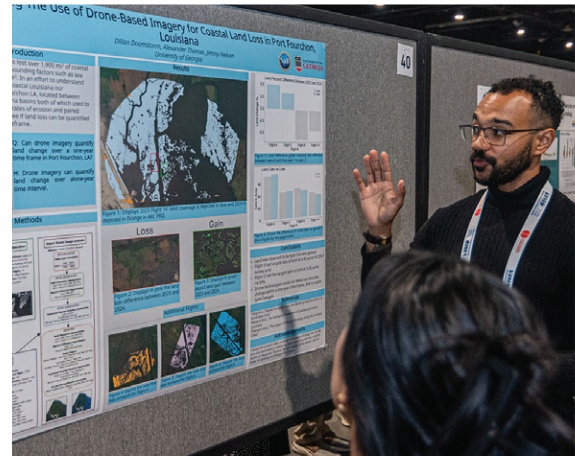
Emese Hadnagy, Eliza Heery, Yajun An, Lorne Arnold, Nicole Moore, Kim Martini

Additional Teams

Ferris State University, Kendall College of Art and Design. “A String of Pearls.” *Students:* Benjamin Cazlea, Michael Gorman, Eric Osborne, David Taylor. *Faculty Advisor:* Omar Degan

James Madison University. “Edgeworks: Living and Learning at the Tidal Threshold.” *Students:* Chau Tran, Diego Usurin, Daniel Judy, Madison Montes, Shaun Davis, Breiner Rugeles. *Faculty Advisor:* Jori Erdman

Reflections on CERF 2025





Photos: José R. Vázquez

Student Coastal Design Competition *(continued from page 9)*



Vedika Gupta and Kaena Sutanu representing the National University of Singapore team at CERF 2025

teams develop data-driven designs and actionable plans that work with and for community priorities.

The 2025 CERF Student Coastal Design Competition focused on critical resilience issues around coastal settlements, ecosystem restoration, flood protection, and development in the coastal Maryland region. The site of the 2025 competition was the Galesville watershed

centered around the town of Galesville, an unincorporated town in Anne Arundel County, Maryland. Among priority citizen concerns are frequent flooding of the low-lying community and the current stormwater swale system which is frequently overwhelmed and does not sufficiently manage or treat runoff.

The winning design project proposes a community-centered framework

that integrates feedback loops that reinforce ongoing community participation, promotes adaptive interventions, and focuses on five main themes: dine, farm, play, learn, and protect. The team proposed many actionable designs that would address these themes, including installing new bike shelters and paths, expanding and restoring habitat through marsh planting and living breakwaters, and enhancing local dining by promoting bay-to-table eating.

Second place went to a team from Anne Arundel Community College and the University of Maryland Center for Environmental Science, while third place went to a team from the University of Washington, Tacoma. Congratulations to all teams participating in the 2025 competition.

Ombuds and Code of Conduct Report

We were once again excited to bring Nnena Odim of MWI to the conference to serve as the conference ombuds. The ombuds is an impartial, independent, off-the-record resource who is available on-site to hear concerns confidentially. Nnena was available to assist with identifying options and resources to address conflicts or issues such as harassment, discrimination, or any violation of CERF's Event Code of Conduct. This resource was available to all attendees, staff, exhibitors, and anyone participating in CERF 2025. Nnena is a mediator, ombuds, attorney, trainer, and consultant with over 25 years of experience in conflict resolution. Since 1997, Nnena has mediated a wide range of disputes involving employment, housing, business, consumer, education, and family matters. She first served as the CERF conference ombuds in 2023 in Portland, Oregon.

The MWI post-conference report provided valuable insights into the ombuds activity. During the four days Nnena was on site, she connected with approximately 100 participants in hallways, sessions, and common areas, and served two visitors. Additionally, MWI created three LinkedIn posts to create visibility about this resource and support CERF's efforts to promote a safe and inclusive conference. Each of MWI's posts reached over 1,500 people.

Overall, attendees described the conference as welcoming, well-organized, and inclusive. Many people expressed appreciation for having an ombuds available on site. MWI provided general observations on what went well such as a warm, inclusive atmosphere; clear, helpful signage; and supportive resources such as the low-sensory room. They also provided opportunities for

improvement including providing additional attention and training related to diversity, equity, and inclusion topics; considering the needs of participants with more limited budgets; and reinforcing expectations for respectful participation in sessions.

We hope attendees value the support having an ombuds provides for conference attendees.

CERF received no formal reports of Code of Conduct violations through our various reporting mechanisms. We hope the visibility and reinforcement of the Code of Conduct throughout the conference as well as the presence of the ombuds has resulted in a decrease in violations of the Code of Conduct. If you have feedback, please contact CERF Executive Director Susan Park (spark@cerf.science).

Highland Springs High School at the CERF Biennial Conference

Dawn Sherwood

Highland Springs High School, Richmond, Virginia, USA



All the high school students attending CERF 2025 along with other conference attendees Photo: José Vazquez



Highland Springs High School seniors having a blast painting the mural Photo: Dawn Sherwood

On Monday, 10 November, approximately 1,500 scientists, managers, students (both college and local high school), and professionals gathered in Richmond, Virginia, for the 2025 CERF Biennial Conference. This premier event serves as a crucial hub for sharing the latest research and fostering collaboration on pressing coastal and estuarine issues. I was honored to bring 20 National Science Honor Society students (11th and 12th graders) to the conference. This intensive, real-world experience provided an unparalleled glimpse into the world of professional science and academia, far beyond the traditional classroom setting.

Attending a national-level professional conference offers immense value to high school students:

Witnessing Scientific Commitment: The students experienced a LONG day: attending the welcome session and observing the impressive professional endurance required. This firsthand exposure redefined their understanding of a career in science, showcasing the passion and dedication of researchers.

Direct Engagement with Research: Students moved beyond introductory concepts by attending actual scientific sessions. Most opted for talks focused on: local Tribes or invasive species, engaging directly with complex, cutting-edge environmental research. This allowed them to connect their high school science curriculum to real-time, global challenges.

Networking and Career Exploration:

- The conference was a rich environment for interaction. Students visited the Exhibit Hall, where they spoke with vendors and college representatives, gathering information on undergraduate programs and scientific tools.
- The Highland Springs contingency participated in the Black, Indigenous, and People of Color (BIPOC) lunch, providing vital networking experience and exposing them to discussions on diversity and inclusion within STEM.
- They actively networked with professionals while assisting with a collaborative event mural, breaking down barriers and allowing for informal, high-value career conversations with scientists and career professionals.

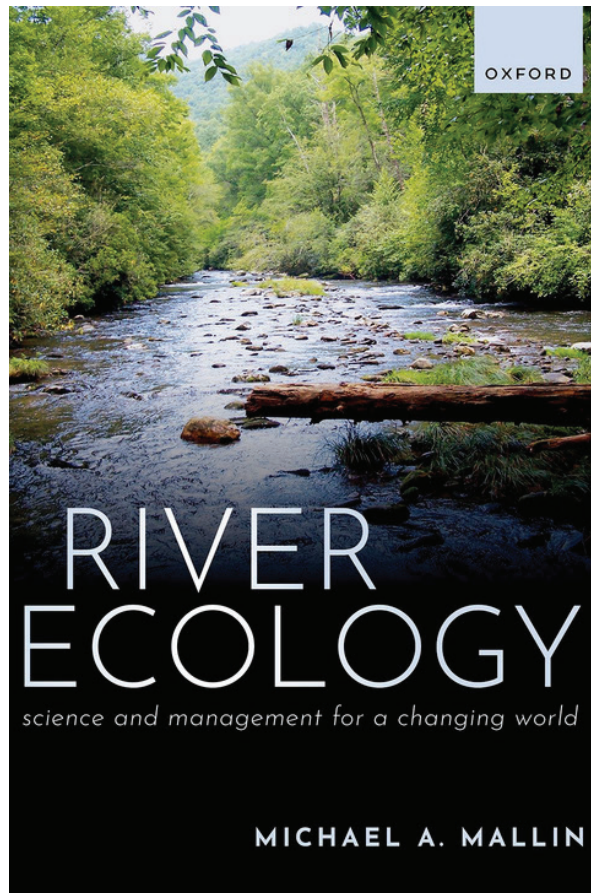
Connecting with the Community: The students thoroughly enjoyed speaking to college students, scientists, and career professionals. This diverse interaction provided: insights into potential career paths and the necessary steps to pursue them, transforming abstract careers into achievable goals. The students also got to network with professionals as they helped paint a mural that was created for the event.

We definitely want to thank Susan Park, Executive Director of CERF, for finding the funding to cover all of our students' attendance, as well as feeding us both lunch and dinner. This generosity ensured that this transformative experience was accessible to every student, highlighting CERF's commitment to cultivating the next generation of environmental stewards and researchers.

Editors' Note: Forty-four students and six staff members from Richmond-area high schools attended the CERF conference thanks to generous funding from the National Oceanic and Atmospheric Administration Ocean Acidification Program. In addition to Highland Springs, students came from Hermitage High School and the Groundwork RVA Green Team youth development program. This article was first published in *Masthead*, the quarterly newsletter of the Mid-Atlantic Marine Education Association.

River Ecology

Science and Management for a Changing World



Rivers have been vitally important to human populations worldwide for millennia as “highways” for inland travel, and as sources of water for drinking, cooking, cleaning, manufacturing, irrigation, and power generation, as well as repositories for human, animal, and industrial wastes.

This accessible textbook takes a broad approach to river ecology, covering the basics but going beyond by including topics that are often overlooked such as blackwater streams and rivers, tidal creek ecosystems, and reservoir limnology. Since most running water (lotic) systems have been altered or impacted by human activities, there is significant emphasis on anthropogenic impacts, including sedimentation, nutrient pollution and related eutrophication issues as well as the effects of dams and river fragmentation, power plant operations, chemical contamination, invasive species, wastewater treatment discharges, industrial scale livestock pollution and the impacts of hurricanes and climate change on river ecology.

Rural and urban storm water runoff pollution is emphasized, and the current state of stream and river protection and restoration is also discussed. While the book is aimed at the graduate student level, it is also designed to be of use to working professionals including planners, environmental engineers, natural resource managers and the NGO community.

THE AUTHOR: Michael A. Mallin

Michael A. Mallin, Research Professor, Center for Marine Sciences at University of North Carolina Wilmington.



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Charles Martin Joins as *Estuaries and Coasts* Reviews Editor

CERF is pleased to announce that, as of January 2026, Dr. Charles W. Martin is the new Reviews and Perspectives Editor for *Estuaries and Coasts*. Martin is an estuarine ecologist at the University of South Alabama and Dauphin Island Sea Lab, where he leads the Martin Lab focusing on estuarine and coastal ecosystems of the northern Gulf of Mexico. His research centers on submerged aquatic vegetation/sea-grass ecology, trophic interactions, and climate-driven range shifts of fishes and invertebrates, integrating field and experimental ecology to inform restoration and management. He serves in editorial roles across several journals and works closely

with agency and non-governmental organization partners on applied conservation projects.

As the Reviews and Perspectives Editor, Martin is responsible for soliciting, promoting, and managing high-quality review and perspectives articles that advance knowledge of estuarine and coastal systems. Anyone interested in publishing a reviews or perspectives article is encouraged to reach out to Martin through the editorial office (estuariesandcoasts@gmail.com).

CERF thanks outgoing *Estuaries and Coasts* Reviews and Perspectives Editor, Dr. Ken Heck, for his eight years of service to the journal.



Estuaries and Coasts Special Collections

Leading a Special Collection in *Estuaries and Coasts*¹ (the official journal of CERF) has never been more effective or accessible. With our continuous publishing model, your collection is no longer tethered to a single print date—accepted articles are published online as soon as they are completed, getting your science to the community faster. Once published, all contributions are collated into a dedicated online Special Collection, ensuring they are easily accessible in one [central location](#).²

Why Lead a Special Collection?

Special Collections are curated sets of articles focused on timely research themes within the journal scope. They offer a high-visibility platform to:

- **Feature emerging topics:** Rapidly disseminate research on cutting-edge topics and urgent

challenges that affect estuaries and coasts worldwide.

- **Showcase conference highlights:** Unify research from conference sessions, such as those at CERF Biennial Conferences or CERF Affiliate Society meetings.

- **Synthesize results:** Bring together findings from scientific workshops or large-scale collaborative projects that represent noteworthy contributions to the mission of the journal.

- **Commemorate milestones:** Celebrate a special event that marks a milestone in the history and growth of the journal, or honor individuals who have made important contributions to our field.

How to Lead

Interested in leading a collection? Simply email a brief proposal outlining your theme, guest editors, and list of prospective papers to our

co-editors in chief.

As a guest editor, your role is to organize the manuscript ensemble, pre-screen the papers for quality, and ensure the papers relate both to each other and the broader literature. The *Estuaries and Coasts* Editorial Board handles the "heavy lifting" of the peer-review process.

Submit your proposal today!

Melisa Wong: melisa.wong@dfo-mpo.gc.ca

Just Cebrian: justcebrian1234@gmail.com

For further information, see the *Estuaries and Coasts* [Special Collections Guidelines](#).³

1. <https://link.springer.com/journal/12237>
2. <https://link.springer.com/journal/12237/collections>
3. <https://link.springer.com/journal/12237/updates/17216914>



Estuaries and Coasts Outstanding Reviewers

Estuaries and Coasts would not be successful without the hard work of hundreds of volunteer peer-reviewers whose dedication and expertise play a crucial role in upholding the quality and integrity of the articles published in the journal. CERF recognizes the critical contributions of all our reviewers and thanks you for the generosity of your time. Reviewers are the lifeblood of the journal, and we feel it important to recognize those that go above and beyond in their service. The *Estuaries and Coasts* Editorial Board is proud to recognize the dedicated efforts of outstanding reviewers in each issue of *CERF's Up!* This recognition hon-

ors reviewers based on the quality, number, and promptness of reviews.

Between July and December 2025, we are happy to highlight Outstanding Reviewers for their significant contributions to the quality and success of *Estuaries and Coasts*. We thank and highlight one reviewer who completed four reviews: Hallie Fischman; and one reviewer who completed three reviews: Wei-Jen Lin. We are especially grateful to reviewers who complete reviews rapidly as this allows us to offer feedback to anxious authors and publish papers quickly. We thank the 21 people who completed at least two reviews, and we highlight two

reviewers who completed their two reviews in less than a week on average: Elorri Arevalo and Shivanesh Rao. The other 19 reviewers with two reviews each were: Hanna Brum François Amaral, Tal Ben-Horin, Reginald Blaylock, Henry Lok Shan Cheung, Kenneth Czaplá, Zhijun Dai, M. Zachary Darnell, Derek John Detweiler, Geoffery Anak James Gerusu, Matthew Eric Kimball, Melinda Martinez, Daphne Munroe, Zoë Shribman, Megan Tomamichel, Konstancja Woźniacka, Liuqian Yu, and Richard C. Zimmerman.

Thank you for your invaluable contributions to CERF and *Estuaries and Coasts!*

Honoring a Legacy: The Iris Cofman Anderson Fellowship Fund



The Dr. Iris Cofman Anderson VIMS Fellowship Endowment was established in Iris' memory to support graduate students at her beloved institution. Her family envisions a future where the fellowship fully supports a student's academic journey—from tuition to research

expenses—ensuring that her legacy continues to inspire and empower the next generation of marine scientists.

Iris was a beloved faculty member at the College of William & Mary's Batten School & Virginia Institute of Marine Science (VIMS), whose pioneering research and mentorship shaped generations of marine scientists. A leading expert in estuarine and coastal carbon and nitrogen cycling, Iris' research laid the foundation for critical advancements in understanding nutrient dynamics in coastal ecosystems. Over the course of her 30-year career, she mentored more than fifteen graduate students, many of whom have gone on to

become professors at institutions such as the University of Connecticut, Virginia Commonwealth University, and William & Mary and VIMS.

Her contributions to the field were recognized with numerous prestigious honors, including the CERF Odum Award for Lifetime Achievement in 2019. She also served as coeditor in chief of CERF's journal *Estuaries and Coasts* from 2010 to 2013 and as Reviews Editor from 2013 to 2017.

You may help celebrate her legacy and support future scientists by [making a gift](#) to the Dr. Iris Cofman Anderson VIMS Fellowship Endowment (5298)¹.

1. http://impact.wm.edu/vims_anderson

The Latest Coastal & Estuarine Sciences News (CESN)

Merryl Alber, CESN Editor, University of Georgia

Janet Fang, CESN Science Writer/Managing Editor

The mission of CESN is to highlight the latest research in the journal *Estuaries and Coasts* that is relevant to environmental managers. CESN is a free electronic newsletter that is posted online and delivered to subscribers on a bimonthly basis (six issues per year). Please visit www.cerf.science/cesn to read the full summaries and sign up to have future issues delivered to your email inbox. And please encourage environmental managers you work with to sign up as well.

2025 CESN Issue 6

Including Seagrass Beds in Shoreline Stabilization *Remember to consider the subtidal slope in living shoreline designs*

Source: Benson, G.W. et al. 2025. Examining the Relationship Between Nearshore Seagrass and Living Shorelines in a Subtropical Estuary. *Estuaries and Coasts*. DOI: 10.1007/s12237-025-01595-0

<https://rdcu.be/eH10o>

<https://www.cerf.science/cesn-2025-issue-6#Article1>

Are Hard Clams and Restored Seagrass Fighting for Bottom Space?

A new predictive model for seagrass distribution

Source: Breitenbeck, G.A. et al. 2025. Bottom-Use Conflicts in Shallow Coastal Zones: Hard Clam (*Mercenaria mercenaria*) Aquaculture and Restored Seagrass (*Zostera marina*). *Estuaries and Coasts*. DOI: 10.1007/s12237-025-01593-2

<https://rdcu.be/eH1Mh>

<https://www.cerf.science/cesn-2025-issue-6#Article2>

Automated Detection of Boat Scarring in Seagrass Beds with ArcGIS

A deep learning tool to help monitor seagrass disturbance

Source: Lawson, K.M. & Q.M. Tuckett. 2025. Semi-automated Detection of Seagrass Scars in Tampa Bay from Aerial Imagery: An Application for ArcGIS Pro Deep Learning. *Estuaries and Coasts*. DOI: 10.1007/s12237-025-01606-0

<https://rdcu.be/eH1Pr>

<https://www.cerf.science/cesn-2025-issue-6#Article3>

Seagrass Can Be Restored in Open-Coast Habitats Too *Broadening the scope of seagrass recovery*

Source: Sanders, R.D. et al. 2025. Open-Coast Eelgrass (*Zostera marina*) Transplant Catalyzes Rapid Mirroring of Structure and Function of Extant Eelgrasses. *Estuaries and Coasts*. DOI: 10.1007/s12237-025-01609-x

<https://rdcu.be/eJgIk>

<https://www.cerf.science/cesn-2025-issue-6#Article4>



Photo: Adam Obaza

ANGELS & SUSTAINERS

Angels

Many thanks to the following Federation members who donated to the William E. Odum Fund, Donald W. Pritchard Fund, CERF Enhancement Fund, Scott W. Nixon Fund, and/or the Legacy Fund between 1 January and 31 December 2025.

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Many thanks to the members who joined or renewed at the Sustaining Member level.*
Your extra efforts on behalf of CERF will ensure the future of the Federation.

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Here Be Monsters: From Kraken to Nessie and Beyond

Stephen S. Hale

ORCID <https://orcid.org/0000-0001-7858-3750>

stephenshale@gmail.com

Sea monster folklore abounds in many cultures around the world. These beliefs long predate the early 1800s discovery of prehistoric marine fossils such as the plesiosaurs from the Mesozoic Era. If giant reptiles and colossal sharks lived in today's oceans, they would make short work of swimmers and boaters—so it's a good thing they vanished before our time. Or did they?

In her 2023 book *Devilfish*, Jenny Higgins traces the history of sea monsters. The legend of kraken attacking ships began in 13th century Scandinavia. Early European maps commonly depicted fantastic sea monsters, including giant

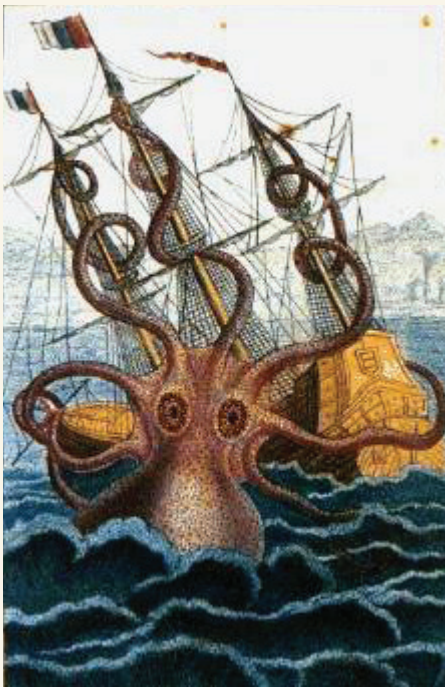


Fig. 1 In 1801, the French malacologist Pierre Denys de Monfort published this image of a kraken pulling down a large sailing ship in his book *Histoires Naturelles, Générale et Particulière des Mollusques*

cephalopods and sea serpents (Fig. 1). Jules Verne's 1870 book *Twenty Thousand Leagues Under the Sea* has giant squids attacking Captain Nemo's submarine.

In 1854, after receiving mailed body parts from stranded giant squids, Japetus Steenstrup at the University of Copenhagen formally named the animal *Architeuthis dux*. Higgins notes that mass strandings of giant squid in Newfoundland (Fig. 2) from 1871 to 1881 sparked public fascination and scientific inquiry. Examinations of the specimens by Louis Agassiz at the Harvard Museum of Comparative Zoology and Addison Verrill at Yale University replaced myth with biology and ultimately laid the kraken legend to rest.

Lakes worldwide also have tales of monsters that capture imaginations. Based on eyewitness accounts and blurry photographs, many of these creatures resemble sea monsters thought to have survived from ancient oceans.

Loch Ness stands apart as having had—along with a hoax or two—extensive high-tech and scientific surveys. As Sheldon and Kerr wryly observed in a 1972 *Limnology and Oceanography* paper "It is well known that there are monsters in Loch Ness. Their most characteristic features are that they are rarely seen and never caught..." Using trophic dynamics, they estimated the lake could theoretically support 10–20 monsters weighing 1,500 kg each. In a 1975 article in *Nature*, Scott and Rines gave Nessie the scientific name *Nessiteras rhombopteryx*,

arguing that legal protection required that. Yet, unlike giant squids, no Nessie bodies, bones, skins, teeth, or scales have yet been found. A 2018 eDNA study led by Neil Gemmell of the University of Otago found no evidence of reptilian DNA in the lake, dealing a further blow to the plesiosaur hypothesis. The study did detect abundant eel DNA.

In North America, *Nessie* has inspired *Bessie* (Lake Erie), *Chessie* (Chesapeake Bay), *Cressie* (Crescent Lake, Newfoundland), and *Tessie* (Lake Tahoe). One beloved lake monster is *Champ*, said to live in Lake Champlain (Vermont, New York,

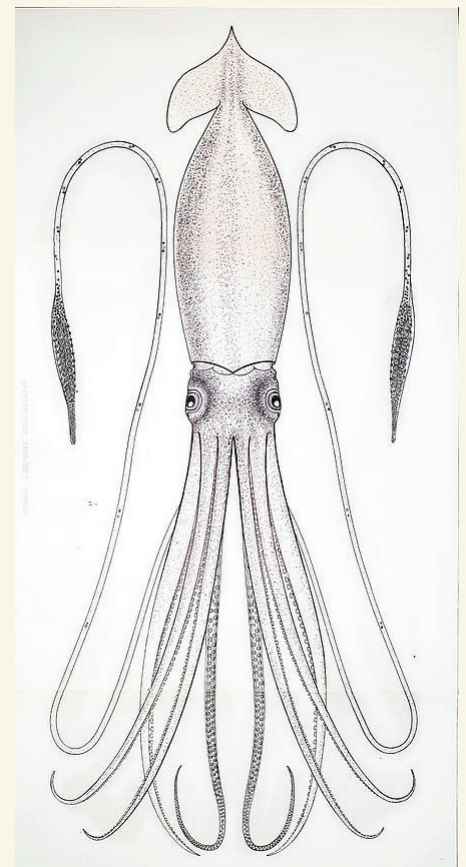


Fig. 2 Addison Verrill 1880 illustration of giant squid
Image: Wikipedia Commons

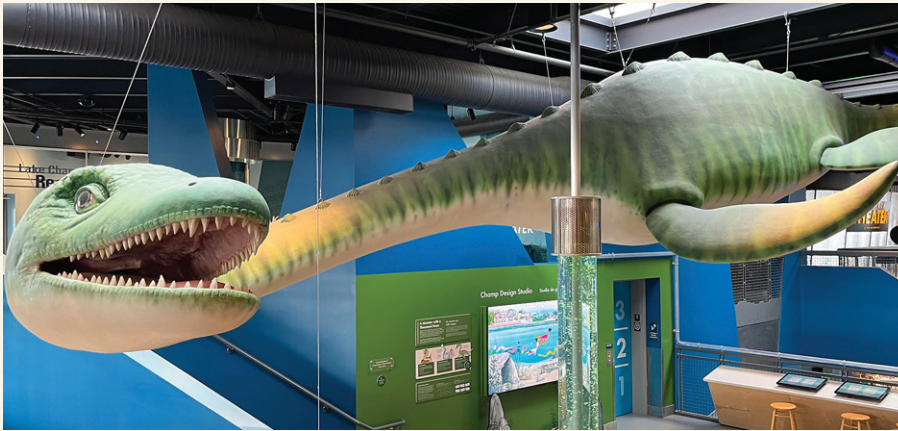


Fig. 3 Champ at the ECHO Leahy Center for Lake Champlain in Burlington, Vermont

Quebec, Fig. 3). Attendees at the Spring 2026 New England Estuarine Research Society (NEERS) meeting in Plattsburgh, New York, will have a chance to spot Champ for themselves. In 1873, showman P.T. Barnum offered a \$50,000 reward for the hide of the "Great Champlain Serpent." Now, both Vermont and New York have passed resolutions protecting *Champ*.

The null hypothesis that no sea monsters still exist has not yet been convincingly rejected. But who knows? Biologists estimate that some ten million different species, possibly many more, exist on Earth; only about two million have been formally described. With so many species left undiscovered, maybe at least one is a sea monster?

National Marine Educators Association 2026

Registration is now open for the National Marine Educators Association (NMEA) 2026 Conference: Meeting of the Waters, happening 12–16 July 2026 in Cambridge, Maryland. This national conference brings together marine, aquatic, environmental, and STEM educators from across formal and informal settings for a week of professional learning, collaboration, and inspiration. As an Affiliate Organization, we're excited to participate in a dedicated CERF Track of Sessions featuring work from our community, alongside engaging concurrent sessions, plenary talks, and place-based experiences in the Chesapeake Bay region. Affiliate members also have access to 50% off any new individual NMEA membership, making this an excellent time to get involved. Use the code CERF50% to join now: <https://www.marine-ed.org/membership>. Whether you're attending to learn, connect, or support colleagues, NMEA 2026 offers a welcoming space for educators at all career stages.

Register and learn more: <https://www.marine-ed.org/2026>

Upcoming Events

New England Estuarine Research Society Spring 2026 Meeting

23–25 April 2026
Plattsburgh, New York, USA
<https://newenglandestuarineresearchsociety.wildapricot.org/MeetingOverview/>

Pacific Estuarine Research Society Annual Meeting

23–25 April 2026
Newport, Oregon, USA
<https://pers-cerf.org/pers-2026/>

Atlantic Canada Coastal & Estuarine Science Society and Bay of Fundy Ecosystem Partnership Joint Conference

19–22 May 2026
Sackville, New Brunswick, Canada
<https://access.wildapricot.org/ACCESS-&-BoFEP-2026>

2026 National Marine Educators Association Conference

12–16 July 2026
Cambridge, Maryland, USA
<https://www.marine-ed.org/conference/2026>



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Contact Information

Coastal & Estuarine Research Federation

2150 North 107th Street, Suite 330
Seattle, WA 98133-9009
(206) 209-5262
info@cerf.science

Executive Director

Susan Park
(804) 381-6658
spark@cerf.science

Chief Operating Officer

Scott Eichenger
info@cerf.science

CERF's Up! Bulletin

Co-editors:

Kyle Capistrant-Fossa and Julie Walker

Managing Editor: Tayton Hewitt

Copy Editor: Andra Kendall

Layout Editor: Rhonda Cole

Comments or questions on any piece in this issue?

Email bulletin@cerf.science

COASTAL & ESTUARINE RESEARCH FEDERATION

2150 N 107th St, Ste 330
Seattle, WA 98133

Phone: (206) 209-5262

Website: www.cerf.science

Email: info@cerf.science

