

2023 MAMEA Concurrent and Poster Session Schedule

10:00-10:45 Concurrent Session 1

Bye-Bye, Bycatch and Hello Terrapin Town!

Celia Cackowski, Marine Education Specialist, Virginia Institute of Marine Science

Sarah Nuss, Marine Education Leader, CBNERR-VA

Anna Caputo, Marine Education Specialist, CBNERR-VA

Bethany Smith, Marine Education Specialist, VIMS MAP

Presentation Location: Patuxent Room

Audience: 6 - 8 Teachers (Middle), 9 - 12 Teachers (High), Informal Educators

Graduate students at the Virginia Institute of Marine Science have translated their research into hands-on VA SEA activities for K-12 classrooms. This session shares two engaging activities with real-world connections. In the first activity, students design bycatch reduction devices to catch as many fish and as few turtles as possible. In the second activity, students explore the habitat requirements of the diamondback terrapin and how land management decisions influence their population.

The Science of the Ghost Fleet: Interdisciplinary Research from Mallows Bay-Potomac River National Marine Sanctuary

Allyson Ropp, Ph.D. Candidate & Dr. Nancy Foster Scholar, East Carolina University

Presentation Location: Chesapeake Room

Presentation Audience: ALL

Now a part of the Mallows Bay-Potomac River National Marine Sanctuary, abandoned wooden vessels from World War I continue to share their stories through scientific research and exploration. Today, the vessels play an integral role in shaping the landscape and aquatic ecosystems of the bay. They are a site that draws in tourists and researchers alike to learn about the natural and cultural resources of Mallows Bay and the larger Potomac River estuary. This session will provide an overview of the ongoing research on the Ghost Fleet of Mallows Bay. This research utilizes natural and social sciences disciplines to illuminate the historical, archaeological, ecological, and hydrological significance of the vessels and bay in the larger estuary. It further aims to understand these vessels in the framework of our changing aquatic environments. Ultimately, it seeks to answer two questions: 1) How will changes to the river impact the wrecks? and 2) How are the vessels impacting the environment? This session seeks to present this research and the associated data as resources for educators to teach about marine science's interconnected nature. It further aims to provide a framework for resource managers to use in planning for managing submerged resources.

Ocean Acidification

Erika Young, Coastal and Marine Education Specialist, North Carolina Sea Grant

Presentation Location: Potomac Room

Presentation Audience: ALL

This presentation includes a demonstration of an ocean acidification experiment derived and modified from BioInteractive. This activity is low cost and shows a real world example of how CO₂ affects the pH of ocean water.

11:00-11:45 Concurrent Session 2

Diving into the World of Plastic Waste and Student-driven Action with the Wave of Plastic Curricular Unit

Jamie Testa, Faculty Research Assistant, UMCES - CBL

Presentation Location: Patuxent Room

Presentation Audience: 6 - 8 Teachers (Middle), 9 - 12 Teachers (High), Informal Educators

The Wave of Plastic is a NGSS-aligned curricular unit helping middle school students make sense of the core ideas related to issues of plastic pollution (particularly those relevant to the Chesapeake Bay watershed). Wave of Plastic focuses on student inquiry of plastic waste, its impacts on marine ecosystems, and solutions by engaging in authentic interdisciplinary practice culminating in comprehensive, student-driven, informed action projects. Funded by the NOAA B-WET program, the unit was co-designed by scientists and science education specialists at the University of Maryland Center for Environmental Science, along with middle school teachers and science supervisors from St. Mary's and Calvert County Public Schools. In addition to NGSS alignment, Wave of Plastic also supports Maryland Environmental Literacy Standards, Maryland Service-Learning Graduation Requirements and the Student Outcome of the Environmental Literacy Goal of the 2014 Chesapeake Bay Watershed Agreement (Meaningful Watershed Educational Experiences - MWEE).

Adventures in Underwater Archaeology Part II: How You Can Get Here too!

Susan Langley, State Underwater Archaeologist, Maryland Historical Trust

Presentation Location: Chesapeake Room

Presentation Audience: ALL

Do you have any students who are interested in going into the underwater archeology field? Learn how educators can guide students who wish to enter this field.

Ocean Literacy, The Ocean Decade, and You

David Christopher, Marine Education Specialist, Delaware Sea Grant

Presentation Location: Potomac Room

Presentation Audience: ALL

The United Nations Decade of Ocean Science for Sustainable Development (Ocean Decade) provides an unprecedented opportunity to raise awareness about the ocean and Ocean Literacy. Through a three-year endorsed project, NMEA will foster Ocean Literacy by working internally and with multiple partners to build a broader understanding of the value of the ocean. This session will provide an overview of the Ocean Decade, NMEA's project to revitalize an Ocean Literacy Community of Practice (CoP), and how MAMEA's members can become Ocean Literacy champions.

2:00-2:45 Concurrent Session 3

Manatee Mania! The Occurrence of Manatees in the Chesapeake Bay

Andrew Wilson, Director, Glen Echo Park Aquarium

Presentation Location: Patuxent Room

Presentation Audience: ALL

Expand your manatee knowledge and learn ways to incorporate these gentle giants into your curriculum. We will explore their biology and place in history. Why are manatees venturing to the Chesapeake Bay and even further? How common are sightings, and what should you do if you see one? Do boating laws need to be changed in the Bay? We will explore these questions and more in Manatee Mania!

Advocacy: Capture the Power of Your Ideas

Margot Lester, CEO, The Word Factory

Presentation Location: Chesapeake Room

Presentation Audience: ALL

Advocacy plays a crucial role in growing our profession and encouraging civic action to protect the marine ecosystem. With a deeper understanding of successful persuasive and opinion content and a strategy to produce it, you become a more effective communicator empowered to influence others and increase relevance and reach. The Power of Your Ideas introduces an audience-centered framework that's an effective antidote to polarized and contentious debates. We learn to anticipate questions and objections, identify and deploy effective supporting details, and focus on desired outcomes. Through a mix of mini-lessons, models, whole-group discussions and writing time, you explore the topics you care about most, get constructive feedback (if requested) and walk out with talking points or a working draft. You also get a digital playbook and one- free email follow-up review. Using a strengths-based approach, the workshop builds on your talents, experience and ability to learn. Instruction is based on proven practices, such as 6 Traits of Good Writing, created by Education Northwest; writing strategies developed in collaboration with a master educator; and tips and tactics from 40+ years working in newsrooms, classrooms and organizational communications.

Diving Beneath the Water with Remotely Operated Vehicles

Shannon Ricles, Education and Outreach Coordinator, NOAA Monitor and Mallows Bay - Potomac River National Marine Sanctuaries

Jessica Frayser, Education and Outreach Specialist, NOAA Monitor and Mallows Bay - Potomac River National Marine Sanctuaries

Presentation Location: Potomac Room

Presentation Audience: ALL

Join NOAA's Monitor and Mallows Bay-Potomac River National Marine Sanctuaries to explore what is hidden beneath the waters. Learn how NOAA uses remotely operated vehicles (ROV) for discovery and research to unlock the mysteries of the deep. Dive 240 feet down to the Civil War ironclad, USS Monitor, and to see where history meets marine life on one of the most famous shipwrecks. Learn how it transferred from a weapon of war to an oasis of life. Leaving

the deep ocean, come explore Mallows Bay and learn about the “Ghost Fleet” of more than 100 World War I wooden steam ships that have now become habitat for both plants and animals. During the session, educators will move through two stations with one modeling ROVs where educators learn about careers, the engineering process, and how ROVs simulate the ingenuity of underwater exploration. The second station will focus on the marine life that lives on shipwrecks both in the deep and in shallow water. Learn how these wrecks are not only valued for their cultural history but also as habitats. Making connections between history, previous and current maritime research, and how this relates to the classroom, creates space for dialogue on how to support student connections to explore what is hidden beneath the waters. In addition, educators will leave with QR codes for a variety of NOAA resources, as well as ideas from discussions with colleagues.

3:00-3:45 Concurrent Session 4

Take Me to the River: How a Community Science Water Quality Monitoring Program is Turning Data into Action

Lisa Wu, Lab Manager & Educator, Potomac Riverkeeper Network

Morgan Bench, Outreach Coordinator, Potomac Riverkeeper Network

Presentation Location: *Chesapeake Room*

Presentation Audience: *ALL*

Since 2000, the Potomac Riverkeeper Network has been working to restore the river and the public’s right to clean water. Their Community Science Water Quality Monitoring Program was formed to fill a gap in water quality reporting to the public. Now in its 5th year, the program has expanded to more than 30 sites throughout both the upper and lower Potomac River. Learn how this monitoring program provides park managers and the public with scientifically sound information on water quality status and is not only helping to restore the river for residents and wildlife but building a force of river stewards for the waters of the District, Maryland, and Virginia. The Riverkeeper’s monitoring program provides data to help inform decisions. Take away ideas for how this data can be used. With a monitoring season from May to September, it is a perfect opportunity for teachers to gain field or lab experience and take this back to the classroom. Being involved in community science makes students more aware than ever of the interrelatedness of human activity and the consequences to our planet. Use the ideas from this presentation to help students develop an interest in local history, environmental issues, and awaken the scientist within.

Parks as our Gateway to Lifelong Environmental Stewardship

J.T. Dean, Director of Individual and Major Gifts, Chesapeake Conservancy

Presentation Location: *Potomac Room*

Presentation Audience: *ALL*

Only 2% of the Chesapeake Bay shoreline is open to the general public despite having more shoreline than the entire state of California. As a result, we are now left with several generations of individuals who live within an hour of the Bay or one of its major waterways yet have little to no connection to it. This impacts the way we collectively care about the Bay and our lands.

Chesapeake Conservancy believes that the more that people experience the Bay, the more they will be inspired to want to protect it. It is necessary that we create more parks and access points to our natural world as a matter of conservation, environmental protection, social justice, historical preservation and education. However, there is not a “one size fits all approach” to park creation. This presentation will examine the importance of park creation today, utilizing public and private partnerships, GIS and AI technologies, Indigenous voices, communities of color and philanthropy. In particular, we will be looking at an effort underway to create the Chesapeake National Recreation Area, a new unit of the national park system. We will discuss how these collective efforts will lead to increased educational opportunities for our students, cultural preservation, environmental protection and enhanced communal stewardship of our lands and waters.

3:45-4:30 Poster Session in the Conference Lobby

Bridge DATA - Bay Nettles: What are the Chances?

Celia Cackowski, Marine Education Specialist for Virginia Institute of Marine Science

Presentation Audience: 6 - 8 Teachers (Middle), 9 - 12 Teachers (High), Informal Educators

The bay nettle (*Chrysaora chesapeakei*) is the most common jelly in Chesapeake Bay during summer. While a great food source for turtles and fish, their sting can be painful to bathers. In this Bridge DATA activity, students calculate the chances of encountering nettles using salinity and water temperature, then check their predictions against the CBEFS forecasts.

Mid-Atlantic Climate Change Education Collaborative

David Christopher, Marine Education Specialist, Delaware Sea Grant

Presentation Audience: ALL

The Mid-Atlantic Climate Change Education Collaborative's (MACCEC) mission is to convene organizations and individuals representing diverse perspectives throughout the Mid-Atlantic region who will create and participate in a network that centers, supports, and uplifts the advancement of education for climate action. MACCEC is an outgrowth of the successful, NSF funded MadeClear Project, a climate change education project in Maryland and Delaware. Originally starting as a virtual conference in the summer of 2020, MACCEC sought to re-engage previous MadeClear participants as well as engage new participants from across the Mid-Atlantic region in climate change education. Since that time, MACCEC has expanded its work including a MACCE Forum in 2022 and the founding several workgroups to advance education for climate action in the region. Through this poster, participants will get an overview of the work being conducted by MACCEC as well as how to get involved in the movement.

Anaerobic Oxidation of Methane as a Mechanism for Producing Sedimentary Dissolved Organic Carbon in Chesapeake Bay

Anna Hildebrand, Graduate Research Assistant, UMCES - CBL

Presentation Audience: ALL

Dissolved organic carbon (DOC) is a major component of the global carbon cycle yet we don't fully understand the components of this large carbon reservoir. In anoxic (no oxygen) marine

sediments, methane-derived carbon has been linked to DOC production through the proposed mechanism of anaerobic oxidation of methane (AOM). However, AOM as a mechanism for the production of DOC has never been tested in an estuary. Here, we show that AOM produces methane-derived DOC in Chesapeake Bay sediments. Incubations using carbon-13 labeled methane were conducted using surficial (0-40cm) sediment along the salinity gradient of the Chesapeake Bay. Methane, carbon dioxide, and DOC were monitored over 10 weeks. Our results show the incorporation of the labeled methane starting material in the DOC pool. Methane concentrations and isotopes decreased while carbon dioxide concentrations and isotopes increased. This study suggests that aerobic, and likely anaerobic oxidation of methane are contributors to estuarine DOC. Understanding carbon cycling in an ecologically and economically important resource is critical to improve estimates of global carbon budgets in a changing climate as low oxygen conditions increase in Chesapeake Bay bottom waters.

Dive Under the Water Without Getting Your Feet Wet

Shannon Ricles, Education and Outreach Coordinator, NOAA Monitor and Mallows Bay - Potomac River National Marine Sanctuaries

Jessica Frayser, Education and Outreach Specialist, NOAA Monitor and Mallows Bay - Potomac River National Marine Sanctuaries

Presentation Audience: ALL

Use virtual reality headsets to dive 240 feet below the Atlantic Ocean to view the USS Monitor. Watch out for the sand tiger sharks! See lionfish, sea turtles, and more as you experience the wealth of marine life now calling Monitor home. Educators can also take a virtual paddle tour of Mallows Bay-Potomac River National Marine Sanctuary. Explore the "Ghost Fleet" from the comfort of a chair.