

Chesapeake Research Consortium



Photo by Green Film Studio

CR

2021 Annual Report

January 2022

From the Director

There can be no purpose more enspiriting than to begin the age of restoration, reweaving the wondrous diversity of life that still surrounds us.

E. O. Wilson

If 2020 was a year of learning to drive on a curved road, then 2021 was surely about resilience behind the wheel, when the road never seemed to straighten enough to give your arms a rest on the wheel. Disturbances (think curves) were almost weekly occurrences and parameters needed to be re-assessed and adjustments made. We lost navigators, both individually (I lost a long time mentor, Dr. Rob Brooks) and globally (E.O.Wilson, above). In the context of loss and change, what is resilience?



In the ecological literature, there are two definitions, each reflecting a different sort of stability. *Engineering resilience* is about efficiency and depends on constancy and predictability; it is about the speed of return to a steady state after a perturbation. *Ecological resilience* focuses on persistence, despite change and unpredictability, and is described by the magnitude of disturbance that can be absorbed before the system is restructured.

This past year, then, was certainly one of building ecological resilience, of persistence in the work of restoration by discovering new ways to work and growing into new spaces. While the first happened by the never-ending curiosity and discovery by the CRC team and our Green Fin partners, the second took form in the addition of two new staff members and the success of our Roundtable webinar series. Randy Kenyatta Rowel and Jeremy Hanson are bringing new perspectives and capacities to our work, and the monthly Roundtable drew the circle of talents even wider, by drawing hundreds into the conversation. We look forward to tackling the challenges of the coming year in the context of our newly expanded resilience and powered by a diversity of perspectives and competencies. What could be more enspiriting? As always, our profound thanks for your passion and partnership.

All the best,

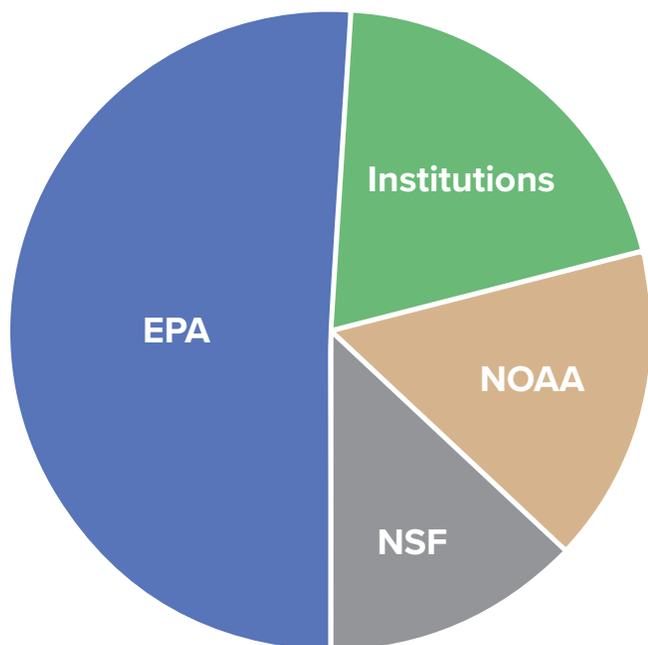
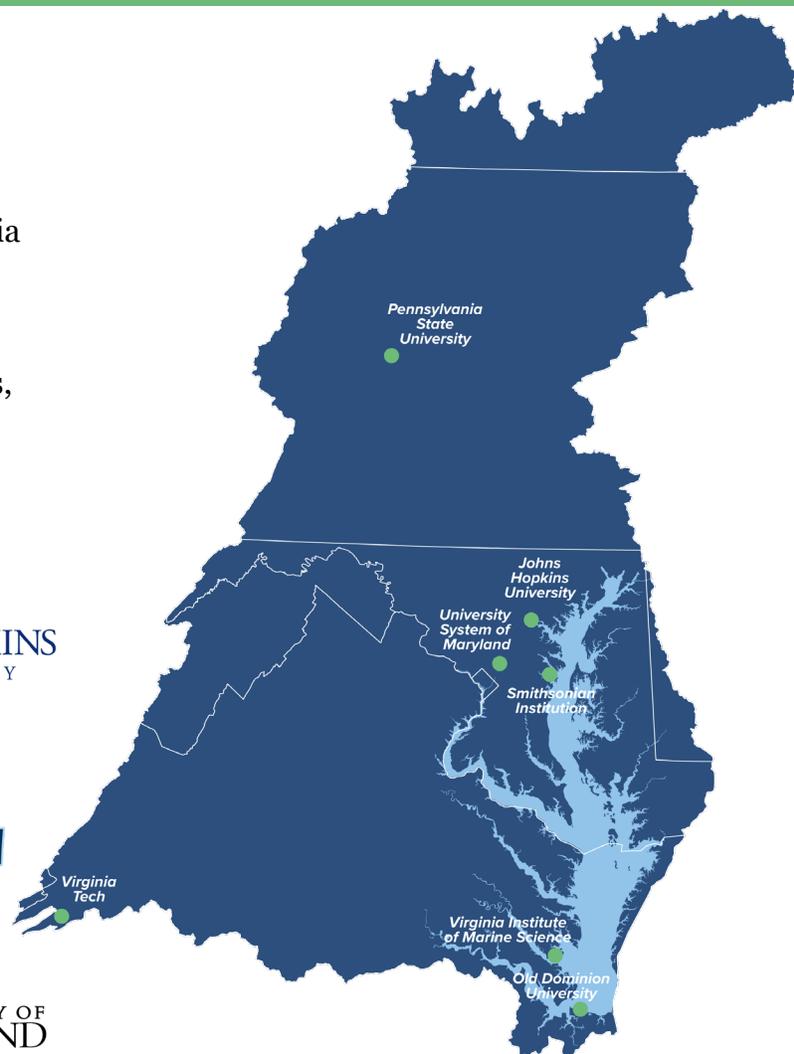
Denice Wardrop
Executive Director
Chesapeake Research Consortium

Institutions & Funding

Established in 1972, the CRC represents Old Dominion University, Smithsonian Institution, The Johns Hopkins University, University System of Maryland, Penn State University, Virginia Institute of Marine Science and Virginia Tech. As an association of some of the most active research centers in the U.S., a primary goal is to ensure continued long-term support for basic and applied research for coastal issues, from land-based watershed considerations through rigorous investigation of water quality and living resources in its aquatic ecosystems.



Smithsonian Environmental Research Center



Thank you to the funders of CRC!

Without the generous support of the Environmental Protection Agency (EPA), CRC's member institutions, the National Oceanic and Atmospheric Administration (NOAA), and the National Science Foundation (NSF), none of the things that we accomplished in 2021 could have been achieved.

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Our Vision



*A sustainable and regenerative Chesapeake
Bay ecosystem that plays a vital role in the
health and well-being of all stakeholders.*

Our Mission

The Chesapeake Research Consortium (CRC) fully enables its member institutions and the broader scientific community in the region to inspire and implement solutions to the understanding and management of the Chesapeake Bay and its watershed, by defining, coordinating, and disseminating the research and education needed for its science-based management.

To transition from this mission to strategic action, we translate “to fully enable” into four “enabling” roles: convening managers and provisioners of science, filling the pipeline of environmental professionals, building the big stage for dissemination of solutions, and supporting member institutions in the research and education efforts that are relevant to the Chesapeake Bay partnership efforts. This framework of enabling roles allows us to plot a course forward in our daily work, resulting in the portfolio of programs and efforts highlighted below.



Convening

Convening brings together a diverse team with different areas of expertise to tackle a shared problem, taking advantage of collective intelligence. It requires a clear purpose that a diverse group of participants can work towards in a collaborative effort. In the case of the CRC, restoration of the Bay and watershed provides this clear purpose, albeit at a large scale. Currently, coordination of STAC, the biennial conference, and CRC’s webinar series (CRC Roundtable) are examples.



Filling the Pipeline

CRC’s aim is to evolve and strengthen a leadership pipeline that attracts and retains a diverse community so that the necessary diversity of perspectives is applied to the protection and restoration of complex human-impacted ecosystems. We do this at two professional levels; the Staffer’s program is notably recognized as having high value for young professionals, and the relatively new C-StREAM program serves undergraduate students from diverse backgrounds. These are examples of programs that cannot be provided at the scale of individual institutions, and are effectively delivered by the CRC.



Building the Big Stage

Exchange of information must happen at a large scale within the restoration effort, both between scientists and managers, as well as among scientists with Bay-related expertise. The bi-monthly CRC newsletter, CRC Roundtable, and accompanying social media efforts serve to provide platforms for targeted, inclusive, and informed conversations that match scientific advances and management needs, as well as provide topical areas around which networks of scientists can form. Both are necessary elements to move us collectively forward toward decision-making for effective and sustainable management of the Chesapeake Bay, its watershed, and its living resources.



Member Support

The seven member institutions of the CRC collectively represent an astounding portfolio of research and educational resources, across a large geographic area. The CRC aims to bring this collective expertise to bear on the restoration effort through the facilitation of collaborative and multi-institutional efforts of both higher education and interdisciplinary research. The three roles above (convening, filling the pipeline, building the big stage) all interweave to serve this purpose, as well as additional tools such as the Chesapeake Bay Expertise Database and the participation in multi-institutional research proposals.

2021 Accomplishments

Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC)

Prepared by Annabelle Harvey



Since its creation in December 1984, the Chesapeake Bay Program's (CBP) Scientific and Technical Advisory Committee (STAC) has worked to enhance scientific communication and outreach throughout the Chesapeake Bay watershed and beyond. STAC provides independent scientific and technical advice and serves as a liaison between the region's scientific community and the CBP. Through professional and academic contacts and organizational networks of its members, STAC ensures close cooperation among and between the various research institutions and management agencies represented in the Bay watershed.

STAC supports the CBP's commitment to advancing science-based decision-making by coordinating a range of collaborative efforts to guide established priorities and characterize emerging concerns. In 2021, we engaged members from

 **23** institutions across the Bay watershed with  **5,000+** hours contributed valued at **\$500,000**

STAC Staff and leadership coordinated 4 quarterly meetings, using Zoom and other online platforms to increase remote participation, input, and collaboration. STAC hosted 6 technical workshops in 2021, totaling in over \$50,000 of funding dedicated to understanding gaps in research, developing programmatic and actionable next-steps, and increasing interagency partnerships. With the release of 4 workshop reports and 2 review reports, STAC has provided over 50 recommendations and findings to the partnership in 2021.

In commitment to utilize social science as a tool to understand gaps in implementation, two workshops, "Advancing Outreach Effectiveness to Improve Conservation Practice Adoption" and "Overcoming the Hurdle: Addressing BMP Implementation Through a Social Science Lens", connected farmers, technical service providers, and researchers to improve outreach capacity and implementation of best management practices.

STAC continued to proactively address issues that assist the partnership in reaching restoration goals. A subcommittee of STAC members gathered with experts, local government officials, and managers to begin understanding the impacts of COVID on the restoration effort, through a 3-part workshop series covering local government funding, fisheries, and nutrient dynamics. Internally, STAC members have continued drafting the Comprehensive Evaluation of System Response (CESR) report, which will recommend strategies to improve understanding of system response and aid in decision-making under uncertainty for attainment of water quality standards.

In 2022 and beyond, STAC aims to continue providing vital research findings, actionable programmatic recommendations, and increased collaboration to the Chesapeake Bay Program partnership. We will focus on improving communication of recommendations and findings, incorporating DEIJ principals in all activities, integrating social science tools, and providing scientific guidance to assist the partnership into 2025.

Funding for the Chesapeake Bay Program's Scientific and Technical Advisory Committee (STAC) is provided through a cooperative agreement with the US EPA.

Environmental Management Career Development Program (EMCDP)

Prepared by Melissa Fagan



CRC's Environmental Management Career Development Program (EMCDP) gives early career environmental managers and scientists an entry point into the Chesapeake Bay's restoration community in a way that not only provides critical professional experience but that also advances individual growth so that future leaders are prepared to continue the restoration and management of the Chesapeake Bay and its watershed.

If we had to choose two words to sum up 2021, they would be transition and balance. Transition was something we experienced (see the numbers below); balance was something we aimed to prioritize. The Chesapeake Bay Program is an excitingly busy place to work! Our Staffers are absolute pros at coordinating the program's complex array of activities, but we want to make sure that the Staffers' experiences are well rounded with layers of different tasks such as technical analysis and visualization work, project management experience, communication and outreach projects, and plenty of professional development opportunities. Here are a few highlights from 2021.

 1
new position
created

 8
staffers hired

 28
interviews conducted

 128
resumes reviewed

- We began piloting a new Climate Resilience Staffer position to better support a critical Bay Program priority area.
- Staffer positions were reviewed and adjusted as needed to make sure they offered the balanced portfolio described above. We are committed to delivering a well-rounded experience for each Staffer in the program.
- A relationship with the LinkedIn Learning platform was established to offer Staffers access to over 16,000 courses to support their professional development learning goals.
- We launched our CRC intern/fellow/staffer alumni network! We are very excited about connecting with our program alums, giving them a place to reconnect and share opportunities, and providing space for them to interact with our current Staffers.



Photo by Alicia Pimental/Chesapeake Bay Program

As look towards 2022, we anticipate that next year's summarizing words may be reinvention and restoration. We will be taking the lessons learned from remote work and applying them to a reinvention of working in our physical offices when the time comes. We will nurture our new alumni network. We will resume sharing our Staffers' stories and accomplishments via our Career Development News blog. And we will continue to do all that we can to make sure that our program is composed of professionals from a diverse array of Bay watershed communities.

Funding for CRC's Environmental Management Career Development Program is generously provided through a cooperative agreement with the US EPA Chesapeake Bay Program.

Chesapeake-Student Recruitment, Early Advisement, and Mentoring (C-StREAM)

Prepared by Randy Kenyatta Rowel



Chesapeake-Student Recruitment, Early Advisement, and Mentoring (C-StREAM) is a program focused on recruiting, advising, and mentoring college students from populations who have been historically excluded from the environmental field and are therefore currently underrepresented in environmental research and management professions. The original program, begun in 2018, consisted of eight funded internship positions, with the CRC initially providing matching of students to internships and delivering professional development support.

Why is this program so important? The utilization of engaged scholarship experiences as a High Impact Practice (HIP) in preparing students for success is based on an influential book by George Kuh in 2008 titled “High-Impact Educational Practices: What They Are, Who Has Access to Them, and Why They Matter”. The book contained a powerful conclusion: high-impact practices have a pronounced effect on the experiences of underserved students, as evidenced by generally positive relationships between high-impact or engaged experiences and different measures of student learning and achievement, such as self-reported gains, grade point averages, and retention. But in several cases, these effects were more pronounced for students in identified groups: African American, Latino/a, and students with relatively low ACT scores. CRC is committed to constantly elevating the level of impact of the internship experience.

In spite of the challenges presented by the continued presence of the pandemic, we successfully supported another class of C-StREAM fellows during Summer 2021. The fellowships represent substantive and detailed projects that are directly linked to partnership science needs. The eight C-StREAM fellows were joined by an additional three with NOAA (supervised by Bart Merrick, CBPO), and all fellowships were successfully delivered virtually. Their projects ranged across disciplinary fields (see infographic) and addressed technical, communication, and education challenges.



Our new C-StREAM Program Coordinator, Randy K. Rowel, and Bart Merrick (NOAA CBPO) jointly managed orientation, professional development, and a final symposium, all in a virtual format. With the new energy of a full-time Program Coordinator, the C-StREAM program was able to see a significant jolt in programmatic and developmental opportunities and experiences during summer of 2021 and saw us able to:

- Provide numerous workshops that involved guest speakers from underrepresented communities such as Vince Legget from Blacks of the Chesapeake
- Further engage with our NOAA partner, Bart Merrick, to collaborate and leverage capabilities to bump up the internship experience
- Provide an opportunity to showcase and highlight C-StREAM interns by engaging a range of new media outlets
- Implement listening sessions with previous mentors and fellows to obtain direct feedback on what did, and did not, work in the development of both fellows and mentors. Soliciting input from our major stakeholders is a key aspect of our continuing drive for the highest level of program effectiveness

2021 Accomplishments

C-StREAM 2021 by the numbers:



Research topics:



In preparation for the coming summer 2022, we have devised two tracks for the program: one consisting of the nine funded internship positions, as well as an opportunity to engage students from underserved populations but funded by other sources for work relevant to the Bay restoration. For the first track, we solicited competitive proposals for the nine funded internships, and received a number of high quality applications from a diverse range of new partners in addition to the previous academic and agency locations (e.g., the Maryland Hall of Archives). Projects for summer 2022 internships cover a wide range of topics spanning the physical and social sciences, from geospatial analysis and research to the digitization, research and collection development of African American life throughout the Chesapeake Bay region.

Our recent initiation of a formal C-StREAM Advisory Committee will further our objectives by providing a wider communication net for recruitment of both students and mentors and assisting us in the development of a strategic plan that includes sustaining funding and leadership. The addition of a Program Coordinator has allowed the vision to become clearer and resources to be optimized for the goal of providing a thriving and positive learning community of interns, mentors, and member institutions. We look forward to a future where our C-StREAM program of student recruitment, mentor and student support, and evaluation and improvement creates a large pool of talented young professionals that stand out as superior investments for decision makers looking to find talent or expertise.

Funding for the C-StREAM program is generously provided by the US EPA, NOAA, NSF, and CRC's member institutions.

The Chesapeake Community Modeling Program (CCMP)

Prepared by Dave Jasinski



The Chesapeake Community Modeling Program (CCMP) is a long-term collaborative effort between CRC, the University of Maryland Center for Environmental Science – Horn Point Laboratory (UMCES-HPL), and the NOAA Chesapeake Bay Office, that is dedicated to advancing the cause of accessible, open-source environmental models in support of research and management efforts.

CCMP welcomed two new steering committee members in 2021; Jeni Keisman of USGS and Randy Rowel of CRC will be bringing their expertise on environmental data analysis and diversity in science respectively to the CCMP leadership. We are glad to have them onboard!

 8 steering committee meetings

 2 new steering committee members

 4 newsletters

CCMP and CRC are gearing up to host the Chesapeake Community Research Symposium 2022 on June 6 - 8, 2022. The theme for the symposium is *Chesapeake Bay Restoration, Resilience, and Reflection: Progress and Future Challenges*. As in the past, the symposium will feature invited speakers, panel discussions, and special sessions with presentations. Participants will be able to attend the symposium in person or remotely.

Funding for CCMP is provided by NOAA's Chesapeake Bay Office.



Microplastics Research: Views Between the Chesapeake and the Baltic

Prepared by Denice Wardrop



Microplastics present short- and long-term environmental and human health challenges for the entire Chesapeake region. There also are pressing issues with long-term microplastic monitoring programs, interpreting micro-plastic pathways, and comprehension of infrastructure resources. Across the Atlantic, the Baltic Sea region also confronts an equivalent set of challenges.

In September of 2021, CRC collaborated with the German Center for Innovation and Research, the Leibniz Institute for Baltic Sea Research, and the Northern Virginia Regional Commission to discuss microplastics mitigation in the Chesapeake Bay and Baltic Sea regions and explored topics such as:

- Comparisons of the design and implementation of microplastics monitoring programs between the Baltic and Chesapeake
- Differences or similarities of research into micro-plastics pathways in the Baltic and Chesapeake Bay
- Considerations about the adequacy of infrastructure resources available to process micro-plastic samples
- Evaluation of Governmental structures and financing for research in the Baltic Sea/Chesapeake Bay on single-use plastics and micro-plastic mitigation

We look forward to fostering more connections and collaborations that support a revised model of international collaboration that emphasizes application of shared discovery at the community level.

Communications

Funding for CRC's communication partnership with Green Fin Studio is provided by US EPA, NOAA, and CRC's member institutions.

CRC Streamline



Prepared by Shirley Chu

In 2021, CRC sent a bi-monthly newsletter, the [CRC Streamline](#). Each Streamline was centered on a particular theme, identified by partner needs in the restoration effort, and presented a curated set of discoveries and colleagues at each institution relevant to that theme. CRC is unique in its position to support collaboration between researchers and faculty throughout the region to address key research questions and advance scientific understanding of the Bay and its watershed.



Looking forward, CRC Streamline will continue to evolve to best support our member institutions and partners. Starting in 2022, CRC Streamline will change to monthly newsletter editions that support the themes of our monthly webinar series, the CRC Roundtable. The newsletter will provide a short background on the webinar speakers, key takeaways from the webinar, connections to the partnership, resources to learn more, and next steps for further action.

CRC Streamline is organized, written, and distributed by Green Fin Studio.

CRC Social Media



CRC uses Facebook, Twitter, and LinkedIn to support our mission and vision. From job announcements to posts about upcoming events, social media is an important and growing part of CRC's virtual presence.

2021 CRC social media by the numbers:



2022 marks the 50th anniversary of CRC and we will be using our social media accounts to celebrate the milestone and showcase new content, like our anniversary logo, as we celebrate the past five decades of CRC.

CRC's social media presence is curated by Green Fin Studio.

CRC Roundtable



Prepared by Lauren Huey

CRC Roundtable is a monthly virtual seminar series that hosts targeted, inclusive, and informed conversations matching scientific advances and management needs related to the Chesapeake partnership. The seminars aim to build connectivity across organizations and identify ways to increase our collective decision-making competency. Each webinar hosts a few lightning-type talks by a diverse range of researchers, managers, and other professionals to set the stage, followed by facilitated discussion with attendees. We've built a gathering space for the community to ask awkward questions and hold an open dialogue.

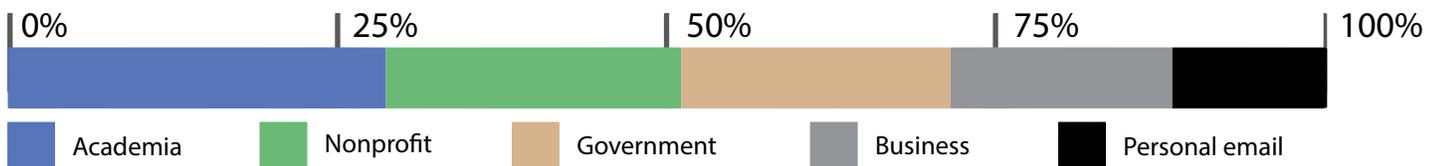
Since the Roundtable's inception in Fall 2020:

 **16**
webinars hosted

 **778**
individual registrants
(with many returning)

 **498**
views of recorded
webinars on YouTube

The CRC Roundtable attracted a diverse audience in 2021:

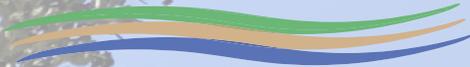


The CRC Roundtable is facilitated and supported by Green Fin Studio. These seminars could not happen without our generous speakers sharing their time and expertise with our audience. Thank you!

Month	Topic	Speakers
JAN	Tackling a Global Problem at the Community Level: Building Climate Resilience	Mark Bennett and Julie Reichert-Nguyen, <i>Chesapeake Bay Program's Climate Resiliency Workgroup</i>
FEB	Keeping Our Heads Above Water: Understanding Sea Level Rise Around the Bay	Ray Najjar, <i>Penn State University</i> Wie Yusuf, <i>Old Dominion University</i>
MAR	Taking a Deep Dive Into Shallow Waters	Marjorie Friedrichs, <i>Virginia Institute of Marine Science</i> Raleigh Hood, <i>University of Maryland</i>
APR	Chesapeake Waters and Their Caretakers: Three Stories from Three Perspectives	Fred Tutman, <i>Patuxent Riverkeeper</i> Carl Hershner, <i>Virginia Institute of Marine Science</i> Carin Bisland, <i>Chesapeake Bay Program</i>
MAY	Minding and Mending Our Streams	John Munsell and Tess Thompson, <i>Virginia Tech</i>
JUN	A Restoration Conversation with the Nansemond Indian Nation and the Upper Mattaponi Indian Tribe	Nikki Bass, <i>Nansemond Indian Nation</i> Leigh Mitchell, <i>Upper Mattaponi Indian Tribe</i> Connor Tupponce*, <i>National Parks Service</i>
JUL	Changing the Face of Bay Restoration and Science	John Wolf, <i>U.S. Geological Survey</i> Nick Coleman*, <i>University of Maryland</i> Bailey Bosley*, <i>Towson University</i>
AUG	Life After Internships	Michael Zeman, <i>Penn State University</i> Adriana Murphy*, <i>Virginia Institute of Marine Science</i> Katie Delph*, <i>Morgan State University</i> Joshua Ramirez*, <i>NOAA's Chesapeake Bay Office</i>
SEP	Moving Beyond Concern: Emerging Management for Contaminants	Kelly Smalling, <i>U.S. Geological Survey</i> Greg Allen, <i>Chesapeake Bay Program's Toxic Contaminants Workgroup</i>
OCT	The Science and the Story of the Conowingo Dam	Kathy Boomer, <i>Foundation for Food and Agriculture Research</i> Joel Blomquist, <i>U.S. Geological Survey</i> Karl Blankenship, <i>Bay Journal</i>
NOV	Invasive Species: Getting Into the Weeds (and Bugs)	Amy Korman, <i>Penn State Extension</i> Ryan Davis, <i>Alliance for the Chesapeake Bay</i>
DEC	PFAS in the Chesapeake Bay Region	Amy Williams, <i>Pennsylvania Department of Environmental Protection</i> Lee Currey, <i>Maryland Department of the Environment</i> Betsy Behl, <i>Environmental Protection Agency</i>

* = student speaker

ORC



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