Chesapeake Bay Program
Science. Restoration. Partnership.

Climate Resiliency Workgroup
June 20th, 2024
1:30 – 3:30 PM EST

Event webpage:
https://www.chesapeakebay.net/what/event/climate-resiliency-workgroup-meeting-june-2024

Minutes

Workgroup Actions

- Jamileh will share the DOD's Carbon Sequestration Literature Review with the workgroup
- Workgroup leadership will provide a follow-up on feedback received at the July Management Board Meeting on the Climate Adaptation Outcome Progress presentation
- Jamileh will reach out to presenters from the Chesapeake Community Research Symposium to see if they are willing let the CWRG leadership publish their presentations on the workgroup's website

Partner-to-Partner Actions

- Community Resilience Working Meeting:
  - John Wolf requested that any folks interested in serving as beta-testers for his 3D Visualizations or know of individuals or communities who would be interested to please email him (jwolf@chesapeakebay.net).
  - Elizabeth Andrews requested that if any folks are interested in reviewing a draft of the guide she is developing, to please reach out to her.
  - Amy Freitag requested that if folks are interested in reviewing the Vulnerability Assessment they are putting together for Baltimore, MD, to please reach out to her.
- Michael Maddox offered to invite anyone interested to their next Stakeholder Workshop. Please feel free to reach out to him at mmaddox@umd.edu or reach out to Jamileh, who can connect you with Michael
- Kevin Du Bois offered to connect with Michael Maddox about a project that could get students to get in the field and map land features for validation of aerial interpretation and identification

1:30 PM **Welcome, Opening Remarks, and Announcements – Mark Bennett, Co-Chair (USGS), Jackie Specht, Co-Chair (MD DNR) and Julie Reichert-Nguyen, Coordinator (NOAA) [5 minutes]**

Focus of meeting:

- *Briefings on recent and upcoming CRWG-supported efforts*
  - *Chesapeake Bay Program's Beyond 2025 Effort*
  - *Management Board July Meeting- Adaptation Outcome Progress Presentation*
  - *STAC Climate Model 3.0 Workshop*
  - *Chesapeake Community Research Symposium*
  - *CRWG's Community Resilience Working Meeting*
- *Presentations from partners on recent community resilience efforts*

Workgroup Announcements:

- *July 11 Chesapeake Bay Program's Management Board Meeting – CRWG co-chair, Jackie Specht will be giving an update on the Climate Adaptation Outcome. This meeting will be climate focused with other updates on climate science needs and progress on the Executive Council Climate Change Directive activities. Agenda and login information will be posted here.*
- *Equitable Resilience Builder: Supports communities in resilience planning with a focus on equity developed by U.S. EPA.*
- *Chesapeake Research Consortium Job Announcement: Environmental Management Staffer for the Chesapeake Bay Program's Habitat Goal Implementation Team. Applications are due **July 7th, 2024**. Feel free to share this opportunity more broadly with your networks and for more information and to apply, click here.*

1:35 PM **Chesapeake Bay Program's Beyond 2025 Update [Peter Tango, USGS] (15 Minutes)**

Peter will provide an update on the Chesapeake Bay Program's Beyond 2025 Effort, including information on the Beyond 2025 Small Group discussion synthesis and the ERG report.

Summary

Peter Tango provided an update on the Chesapeake Bay Program's Beyond 2025 effort. The Beyond 2025 Steering Committee (SC) is currently leading the effort, which includes developing recommendations to meet the Executive Council's (EC) Charge to the Principals' Staff Committee (PSC) on charting a course beyond the current Chesapeake Bay Watershed Agreement. This Charge states that the PSC will recommend a critical path forward that prioritizes and outlines the next steps for meeting the goals and outcomes in the Watershed Agreement beyond 2025. The Steering Committee is comprised of jurisdictional, federal, CBP Goal Implementation Teams and Advisory Committees, and non-government representation.

To address the EC Charge, the SC developed a plan to complete the work and develop recommendations to take to the PSC. This plan included the development of 5 small groups (climate change, healthy watersheds, people, shallow water habitats, and clean water) of

subject matter experts to help inform and develop the recommendations that were elevated to the SC. Parallel to this effort, the partnership brought in an independent contractor (ERG) to conduct an evaluation of the program and provide guidance and insights to how to make the partnership more efficient and effective. Phase 1 of the process focused on the small group efforts to develop the recommendations for the SC as well as the evaluation conducted by ERG. A synthesis of the small group effort as well as the evaluation by ERG were then use to inform two separate reports. The ERG report has already conducted a public comment period and will be presented to the Management Board (MB) and PSC for review. In addition to the evaluation they conducted, they also referenced numerous source materials (e.g., Governance and Management Framework for the CBO, the Comprehensive Evaluation of System Response Report, the Rising Water Temperature STAC Workshop Report, Enhancing the Chesapeake Bay Program Monitoring Networks Report, etc.). The synthesis report from the SC is currently in its public comment phase and will then move to the MB and PSC for review. The synthesis report outline focuses on a critical path forward (recommendations for the agreement and partnership and vision for the partnership), a synthesized summary of high level considerations for science, restoration and conservation, and partnership, and the source material referenced. Both of these reports will be presented to the EC for review in December 2024.

Peter then provided highlights of why the SC is recommending amendments to the 2014 Watershed Agreement moving forward. He underscored that the partnership is making progress, however amendments can help close the gap for outcomes that are not on track to meet their 2025 benchmarks. He added that the Watershed Agreement was built for change. As of the 2023 Outcome Attainability Assessment, 18 outcomes are on-course, two are considered uncertain (pending data updates), and 11 outcomes will not be met by 2025.

Lastly, Peter reviewed a timeline for the remaining portion of this effort. By the 2025 EC meeting, there will be a focus on high-level updates to the Watershed Agreement, maintaining a focus on its core elements (clean water, vibrant, living resources and habitats, healthy landscapes, and engaged people). There is a recommendation to add "conservation" to the programs mission statement. The meeting will also reaffirm the commitment to partnership and continued collaboration. Starting at the 2026 EC meeting, the effort will focus on reviewing, refining, and refreshing outcomes, and commit to a renewed partnership. In the near-term, the SC is gathering public feedback on their synthesis report and after revisions the MB and PSC will review the report during the fall 2024 and present to the EC in December.

Discussion

Kevin Du Bois commented that he is currently reading through the SC recommendations and he is seeing a lot of language about updating existing goals and outcomes, however not much language about considerations for new goals or outcomes. He highlighted the fact that the oyster outcome is on track to be met by 2025, so is there consideration for a new oyster outcome or even a new species instead (e.g., ribbed mussels)? He asked if the language would allow for new goals and new species not already identified in the Watershed Agreement. Peter Tango that he has raised the same question and he thinks it will be a topic in the upcoming SC meeting. Katie Brownson commented in the chat that it was her understanding that the

jurisdictions did not want the program to consider new goals/outcomes until the current goals have been met. She added that she thinks there is particular concern about establishing new goals until the water quality goals have been met. There has been sensitivity to any language suggesting a need to establish new goals/outcomes at this stage. Hopefully that can come in one of the later phases though. Molly Mitchell commented in the chat that she is curious on how Kevin sees a mussel outcome working. Since there isn't a fishery, they are basically living everywhere that they want to live. She was wondering what he envisions as restoration activities? She added that she sees oyster bags and marsh preservation activities are probably the most important thing for the mussels. Kevin responded that he was thinking along the lines of associating mussel populations with new wetland creation or restoration efforts (Co-restoration/establishment) and was wondering if Molly had any other ideas. Molly responded that they recruit really quickly to oyster bag structures and in other locations they have been grown in bags in the water column. But preserving eroding marsh edges might be the most critical action to reduce loss of existing mussel populations. Molly also added that they have developed a mechanistic model that could show how increasing the mussels in living shorelines would contribute to increased nutrient removal (and improved water quality). She commented that they have not done that specific analysis yet but it would be worth running the model to see the impact. Joel Carr asked if it is embedded in the SCHISM framework. Molly responded that it is a Stella Model (mechanistic not hydrodynamic) and is very detailed. She added that it would be interesting to combine the two if they could find funding for it. She also added that it can interface with ArcGIS, so it is possible to add driving information (like that from SCHISM).

1:50 PM **Adaptation Outcome Progress Presentation for Chesapeake Bay Program's Management Board [Julie Reichert-Nguyen, NOAA] (10 Minutes)**
The Climate Resiliency Workgroup is providing a progress update on our Adaptation Outcome to the Management Board at the July meeting. Jackie will briefly review the key points that will be presented to the Management Board for workgroup awareness.

Summary

Julie presented an overview of the Climate Resiliency Adaptation Outcome Progress Presentation that will be shared at the Management Board (MB) Meeting on July 18th, 2024 as a part of the Chesapeake Bay Program's Strategy Review System (SRS). She commented that there have been updates to the SRS process, including the option to provide progress updates instead of participating in a full SRS cycle, which includes workplan development and management strategy updates. Workgroup leadership decided not to present a progress update on the Climate Resiliency Monitoring and Assessment Outcome, as it is on course, while the Adaptation Outcome is categorized as uncertain. Tracking progress towards the Adaptation Outcome is difficult as the outcome language is qualitative, there is no mechanism for project tracking, and research around resilience effectiveness and project success is lacking (e.g., need for performance metrics and long-term monitoring). It is difficult to obtain research funding for the understanding resilience effectiveness and developing performance metrics.

Julie reviewed that while the overall progress of the Adaptation Outcome is uncertain, recent progress is categorized as increasing, as the workgroup is supporting a number of adaptation

efforts and initiatives. This includes the GIT-Funded Marsh Adaptation Project, seeking support for research on Nature-Based Solutions and supporting partner efforts, and facilitating workgroup and partner connections around the topic of Community Resilience. Julie then highlighted challenges that impede progress, which include unclear GIT-Funding processes, misalignment between the structure of the workgroup and the Chesapeake Bay Program (i.e., the workgroup serves as a science support workgroup and not a Goal Implementation Team), and the workgroup is lacking jurisdictional representation. Julie highlighted both short-term and long-term actions to help make progress towards the outcome, which include developing tracking methods for coastal adaptation methods in the near term and developing quantifiable outcome language through the Beyond 2025 effort, identifying funding for metrics/methods development to assess resilience effectiveness, and identifying/pursuing support for long-term monitoring of projects. Julie asked for feedback from the workgroup on these actions.

Discussion

Fredrika Moser commented that she thought the presentation was good. Nicole Carlozo commented that the term "coastal adaptation project" was broad; Julie asked if she had any suggestions for different language, which Nicole responded that she would think about it. Amy Freitag stated that she agrees with Nicole, and was thinking of small-scale neighborhood projects being different than Bay-wide initiatives.

Kevin Du Bois commented that the Department of Defense tracks its projects that have climate resilience co-benefits. He added that they also developed a carbon sequestration calculator to hopefully shed light on how DoD land management provides climate resilience benefits.

Fredrika commented that she remains taken aback by how little recognition of climate there is in the new potential Chesapeake Bay Watershed Agreement.

Mark Bennett asked if Julie and Jackie Specht (CRWG Co-Chair) would provide a follow-up on the feedback they receive from the MB. Julie responded that they can provide a briefing at the August CRWG meeting.

2:00 PM **STAC Climate Model 3.0 Workshop Briefing [Mark Bennett, USGS] (10 Minutes)**
Mark will report out on the recent STAC Workshop "Climate Change Modeling III: Post 2025 Decisions," which took place at the beginning of May. The Climate Resiliency Workgroup supported this effort by hosting a joint meeting in April, alongside the Modeling Workgroup and Urban Stormwater Workgroup, to identify climate considerations to discuss at the workshop in May.

Summary

Mark provided an overview of the STAC Climate Modeling 3.0 workshop, which builds upon two previous workshop efforts that have guided how to incorporate climate considerations into the Chesapeake Bay TMDL. The workshop focused on what climate models are being used and what datasets and projections should be incorporated. In addition to discussing water quality parameters included in the TMDL (e.g., relating dissolved oxygen, clarity, chlorophyll to

nitrogen, phosphorus, and sediment), there was an emphasis on living resources. He then provided an overview of the last modeling analysis, which was conducted in 2019-2020 and incorporated climate change projections through 2025 (Chesapeake Bay Watershed Agreement benchmark) and 2035 and indicated that further reductions would be necessary to meet water quality goals. He then reviewed some of the science considerations that were highlighted when thinking about climate change's impact on dissolved oxygen (e.g., precipitation, increased air and water temperature, sea level rise, increased flow). These considerations were a focus of discussions in the previous workshop efforts and drove a lot of the updates to the model to incorporate climate change considerations.

Mark then provided an overview of the recent workshop's discussions and highlights. The discussions focused on reviewing the current and next generation models and hearing insights from estuarine modeling, watershed modeling, and living resource experts on changes that should be made to the current suite of models that are in development. During the workshop, discussions were held in breakout sessions both vertically (i.e., across different areas of expertise) and horizontally (i.e., within areas of expertise), with recommendations developed during these sessions. At the end of the meeting, the workshop participants prioritized the various recommendations that will be published in the report. Currently, the report is being drafted and will be shared for review and comment with workshop participants soon.

2:10 PM **Chesapeake Community Research Symposium Briefing [Jamileh Soueidan, CRC] (10 Minutes)**

Jamileh will report out on the highlights from the Chesapeake Community Research Symposium. Julie and Jamileh co-led a special session around the tidal recommendations that were developed during the Rising Water Temperature STAC workshop. Presentations included temperature impacts to key living resources and habitats (e.g., striped bass, Atlantic sturgeon, oysters, and seagrass), research around marine heatwaves and their impacts in the Chesapeake Bay, and communication of environmental conditions' impacts on key fishery species.

<u>Summary</u>

Jamileh provided highlights from the special session that she and Julie Reichert-Nguyen co-led at the Chesapeake Community Research Symposium. The session titled, "Tackling Ecosystem-Level Impacts from Rising Water Temperatures in the Tidal Waters of the Chesapeake Bay," aimed to better understand current efforts in the Bay that could align with the management recommendations and research needs that were identified during the Rising Water Temperature STAC Workshop. The recommendations focused on several themes to build resilience to the effects of rising water temperatures on living resources, including promoting ecosystem-based management, increasing understanding of extreme stressor impacts on living resources, minimizing multiple stressors, maximizing nearshore habitat restoration and protection, and preparing for and communicating these impacts. Topics covered in this session included habitat suitability, extreme stressors, climate change modeling for fish, benthic

organisms, and submerged aquatic vegetation related to habitat use, living resource response, and/or species community shifts, and the communication of such information.

Jamileh then briefly reviewed some key takeaways from the presentations. Research around marine heatwaves indicated that these events are increasing in frequency, intensity, and duration in the Bay with potential impacts to key living resources. Additionally, the vertical structure of the events vary spatially and seasonally. Striped bass have experienced climate driven impacts both physiologically (e.g., year-class success) and to their habitat e.g., suitable summer habitat conditions are degrading). Current research around climate impacts (i.e., summer warming and fall storms) on Atlantic sturgeon fall-spawning indicate that raw summer temperatures and storms do not have an impact on spawning, despite evidence of tropical storms impacting distribution, however there is ongoing research into understanding how gradients and rates of change in temperature and flow can impact spawning. For habitat, increasing temperatures will widen the shift in dominant species of SAV. Additionally, ecosystem modeling to simulate habitat change scenarios show that efforts with any SAV restoration and maintaining current levels of oyster restoration, with no harvesting, together will result in increased productivity and habitat through 2040. Lastly, one presentation shared efforts around how they communicate seasonal environmental conditions relative to long-term trends and linking these conditions to potential living resource impacts to help inform ecosystem-based management.

Jamileh ended the presentation by making connections across the information that was shared, as all presentations focused on different aspects of temperature impacts on the Bay and can be used to inform habitat risk assessments and forecasting tools, where to target nearshore monitoring networks, and how to build resilience through habitat restoration.

Julie commented that it would be helpful to see if presenters from the session are willing to share their slide so they can be accessed through the CRWG's webpage for anyone interested.

2:20 PM **Community Resilience Working Meeting Briefing [Jamileh Soueidan, CRC] (10 Minutes)**

Jamileh and Jackie will report out on the key takeaways from the Community Resilience Working Meeting that was held on June 17th, 2024. Discussion topics focused on understanding common factors in community resilience decision support tools and metrics and identifying gaps in these tools as well as understanding how to engage with communities around the topic of climate change thresholds and tipping points.

<u>Summary</u>

Jamileh presented highlights from the Community Resilience Working Meeting, which had focused discussions to help inform three community resilience efforts around the Bay. These efforts include the development of a best practices guide for local governments in VA (Elizabeth Andrews, UVA), an ongoing climate vulnerability assessment in Baltimore, MD and the surrounding areas (Amy Freitag, NCCOS), and the development of 3D mapping and communication on climate change impacts on communities (John Wolf, USGS).

The first portion of the working meeting focused on reimaging the community-centric adaptation framework that Elizabeth Andrews developed through her research. Key thoughts from meeting participants included that community engagement should be the first step in adaptation planning, trusted sources and members of the community are important to garner trust and buy-in, and community engagement should be revisited throughout the process, with some participants saying that there should be a parallel framework solely focused on the engagement piece. Additionally, folks highlighted the need to understand the funding sources ahead of plan development to ensure that key components to secure funding are addressed in the plans.

The second portion of the meeting focused on data, metrics, and tools. Participants were asked what common factors they look for in community resilience tools and data to help inform decision-making. Responses included finer-scale data (e.g., community-specific, local and regional data source), the inclusion of social vulnerability metrics, prediction ability and scenario evaluation, and visualizations of local changes. Other key thoughts included the importance of co-developing data and tools with communities to better meet their needs and understanding the capacity of local governments and communities to utilize the tools.

The third potion of the meeting focused on how to best engage with communities around the topic of tipping points/thresholds. Participants underscored the need to approach these conversations with sensitivity, including taking the immediacy or urgency away, taking time to build trust, using realistic visualizations of future impacts judiciously, seeking to understand the history and culture of the community before bringing the topic up, and making sure to have some strategies in minds before the discussion. Additionally, participants identified thresholds that they have used or encountered in the past, which include limitations of current infrastructure, repeated loss/ insurance limitations/economics of various solutions, and individualized/ community-specific thresholds.

Follow-up actions from the meeting include the opportunity to review the draft guidance document that Elizabeth Andrews is developing, inviting Amy Freitag back to present on her findings, volunteering as a beta-tester for John Wolf's visualization tools, and sharing the meeting minutes from the Community Resilience Working Meeting.

Discussion

Molly Mitchell commented that there are a couple of websites that can help with selecting the right community resilience tool, to help with local governments and communities when they are trying to navigate which tools would be most appropriate. She linked the Chesapeake Bay Climate Adaptation Toolbox in the chat.

2:30 PM Equitable Engagement with Communities in the Mid-Atlantic: The MARISA Small Grants Program [Lena Easton-Calabria, RAND] (25 Minutes)

The NOAA-funded Mid-Atlantic Climate Adaptation Partnership (MARISA) ran a Small Grants Competition in 2023 to provide small awards to non-profit local and regional organizations in four focus areas:

- *Climate and Hazard Mitigation Planning (using the MARISA ChaMP tool)*
- *Rural Capacity Building in Virginia*
- *Negley Run Watershed in Pittsburgh, PA*
- *Green Infrastructure in Baltimore, MD*

These grants aimed to support frontline communities in underserved neighborhoods, build local capacity for resilience and adaption to climate change, and build partnerships between MARISA and local organizations. Grants were awarded following a call for proposals issued in 2023 and are running through 2024. This presentation will provide an introduction to MARISA, an overview of the Small Grants program, equity aims, selected grantees, and activities to date.

Summary

Lena Easton-Calabria provided an overview of MARISA's small grants program. She started with background information on MARISA, which is a part of NOAA's Climate Adaptation Partnership/Regional Integrated Sciences and Assessments (CAP/RISA) interdisciplinary research program that enhances learning and decision-making around climate change and its impacts. MARISA specifically covers the Mid-Atlantic region and includes seven partner institutions: RAND, Penn State University, Johns Hopkins University, Cornell University, The Virginia Institute of Marine Science, Morgan State University, and Carnegie Mellon University. It was established in September 2016 with the mission to collaborate with communities in the Mid-Atlantic to enhance their resilience to climate change impacts. MARISA selected three focus areas, each with different priorities as it relates to climate change. The Pittsburgh region is focused on developing integrated modeling and decision support for stormwater managers and climate adaptation in disinvested urban areas; the Baltimore region is focused on equity informed, multi-objective analysis for green infrastructure; and the Coastal Virginia region is focused on coastal flooding and its impacts to rural communities.

The rest of the presentation was focused on the MARISA Small Grants Program. The objectives of this program are to increase meaning participation in and use of MARISA's research products, resources, and expertise, enhance community capacity for climate resilience, and build trust and lasting partnerships in the region. Current small grants vary based on regional needs and includes Rural Capacity Building in Virginia, Negley Run Watershed in Pittsburgh, Green Infrastructure in Baltimore, and Climate and Hazard Mitigation Planning (CHaMP) in the entire Mid-Atlantic Region.

Eligible activities for these grants included building local capacity for resilience, citizen science or cultural projects to collect/disperse climate information, green infrastructure, and the inclusions of art or creative communication tools. The CHAMP competition had tighter eligibility guidelines, requiring applicants to utilize or share the CHaMP tool in their project. In an effort to increase equity in the grant making process, the submission and application requirements were pared down to include a shore project narrative, budget form and justification, and subrecipient information and compliance form. By doing so, they were hoping to receive applications from communities and partners who have in the past been unable to seek funding through similar programs. Furthermore, reporting requirements for awardees was flexible and at the discretion of the awardees to decide how they wanted to report progress.

She then provided an overview of the current funded projects. Upstream Pittsburgh, funded through the Climate Resilience and Adaptation competition, is focused on green stormwater monitoring in the Negley Run Watershed through the establishment of water monitoring sites in two disinvested communities. Temple X Schools, funded through the Green Infrastructure competition, is supporting The Keystone Project in Baltimore, which focuses on holding structured meetings around topics of citizen science and brings together communities in the Baltimore Area. The Nanesmond Nation, funded through the Rural Capacity Building competition in Virginia, is currently creating a baseline vulnerability assessment. Lastly, Resilient Virginia, funded through the CHaMP competition, is focused on conducting webinars, informed by the CHaMP tool, as a part of their Resiliency Academy. Lena has heard from the Principal Investigators on these grants that the Small Grants Program has been easy to navigate and manage, which gives them more capacity and resources to focus on the work itself.

Lessons learned from this program include that there is strength in the diversity of grantee organizations, grant topics, and project goals; prioritizing a realistic funding timeline ahead of the RFP release ensured that grantees received funding when promised; shorter applications and fewer grantee requirements opened up applications to a more diverse pool of candidates; and linking these grants to MARISA's ongoing work has ensured that projects and relationships built are relevant to the team's goals.

Discussion

Julie Reichert-Nguyen asked if there were any limitations on the type of organization that can apply for funding. She was thinking that this type of grant program would be beneficial for training liaisons on how to use and communicate about community resilience tools and was curious if this grant program could be an avenue for that. Lena responded that for-profit non-government organizations, international organizations, and organizations focused outside of the Mid-Atlantic are not eligible. She added that the CHaMP competition is an avenue for training communities and liaisons on how to use this tool specifically. Additionally, she commented that MARISA is available to any organization and/or community when it comes tool MARISA tool support.

Krista Romita Grocholski commented that the Small Grants Program is also reliant on how much funding MARISA gets from NOAA, and as they are mid-way through their five-year funding from NOAA they are working to ensure that this program can be offered again.

Taryn Sudol commented that she appreciated the thoughtfulness that was put into the grant program design. She asked about how many applicants there were and if the competition was steep. Lena commented that there were nine eligible applications, so the competition was not too steep; however, she added that this is spurring them to think about how to provide outreach about the program itself to increase the pool of applicants.

Kayle Krieg asked if Tribal communities who are not federally recognized were eligible to apply. Lena responded that yes, they are also eligible.

2:55 PM **Climate Resilience Network Briefing [Michael Maddox, UMD] (25 Minutes)**

This project's goal is to transfer University of Maryland science expertise into practices for helping Maryland communities cope with the impacts of a changing climate. Although climate change is global, the impacts felt by communities are different. We are empowering communities and local governments to direct our collective efforts to the issues most important to them. By working together, we expect to provide mitigation courses of action directed towards specific local issues.

The CRN brings together the departments of Geology, Geography, Atmospheric and Ocean Sciences (AOSC), the Earth System Science Interdisciplinary Center (ESSIC) and the Marine Estuarine Environmental Sciences (MEES) graduate program. The CRN began operating under the UMD Grand Challenges: Addressing Climate Challenges for a Sustainable Earth in April 2023 and rebranded to CRN in January of 2024. We host an annual meeting titled "Science Serving Communities: Advancing Climate Resilience in Maryland". The 2024 1-day event had over 50 attendees from different groups working towards a climate ready state. The 2025 event will be 2 days and split into different working groups/sessions.

<u>Summary</u>

Michael presented on the current efforts being led by the Climate Resilience Network (CRN), which is based out of and funded by the University of Maryland (UMD). The CRN was established in January of 2024 and is a collaboration between UMD's Departments of Atmospheric and Oceanic Science (AOSC), Geology (GEOG), and Geographical Sciences, the Earth System Science Disciplinary Center (ESSIC), and the Marine Estuarine Environmental Sciences Graduate Program (MEES). The CRN's project team consists of five PI's who chair the involved departments and programs at UMD, a project coordination team, and seven key investigators that are a part of each of the three departments represented.

The CRN focuses on three main topics: coastal impacts, climate resilient agriculture, and land, water and air. They also focus on experiential learning, which includes an extensive internship

program that includes both high school and undergraduate students. Additionally, they have extensive stakeholder engagement with a number of regional partners.

In January, they held a stakeholder workshop (*Science Serving Communities: Advancing Climate Resilience in Maryland*), which was hosted at ESSIC and had ~50 participants from local municipalities, state and federal agencies, and academia. Discussions focused on understanding community needs when it comes to understanding climate impacts to these communities. Stakeholders were immediately interested in installing water sensors, conducting air quality tests, and participating in citizen science. Additionally, the project team was able to solicit letters of support and developed potential funding ideas, and there is potential for a NASA ROSES letter of intent. He commented that they are planning on holding a similar workshop again, so if any workgroup member or interested party is interested in attending then feel free to reach out to him.

Michael then reviewed a number of current projects that the CRN is supporting. The first project focuses on the effects of climate change on streams, floods and water resources. It aims to understand how climate may be impacting the variability of groundwater and streams that are used as water resources for Marylanders, through the quantification of trends in precipitation, stormflow, baseflow, and groundwater recharge and utilize USGS and UMD stream data to examine runoff partitioning. The next project Michael reviewed focuses on freshwater salinization, which is going to provide Montgomery County, MD with high resolution monitoring of salt concentrations to understand effects of road salt reduction strategies and provide insights into drinking water contamination. They are looking at potentially mapping coastal saltwater intrusion as well as engage with other counties. The third project Michael reviewed focuses on advancing near-surface geophysics (NSG) for subsurface hydrology, which seeks to address issues in measuring bedrock depth and groundwater tables along steep hillsides through using NSG. The project employs multiple geophysics technics to image subsurface rock structure, moisture, and the change over time. The fourth project focuses on air quality, specifically assessing methane emissions through mobile surveys, models, and novel methods to attribute emissions and guide effective mitigation by providing information on hidden sources and inventories. The project will specifically inform stakeholders about air quality impacts on communities. The next project Michael highlighted focuses on climate-resilient agriculture. The project integrates various GIS data and EO to create detailed maps and models highlighting climate risk to agricultural areas in Maryland, with the intent of creating an interactive dashboard that provides a user-friendly interface for accessing and interpreting data and serves as a central repository for project findings.

Michael then discussed CRN's Hydronet effort, which focuses on creating a network of sensors to measure sea level rise (SLR) in real time across the Chesapeake Bay. He commented that SLR, coupled with land subsidence, is impacting communities throughout the Bay. The effort seeks to address the lack of sufficient monitoring of frequency and severity of nuisance, blue-sky, and storm-induced flooding in and around coastal and at-risk communities. The project team is working with stakeholders and communities to identify high risk areas and marginalized communities that lack monitoring to deploy a high-density network of low-cost water level

monitors. The information produced by the network can provide real-time monitoring and alerts to potentially inform local governments, including emergency services.

Discussion

Kevin Du Bois commented that if Michael is looking ideas for students to get in the field and map land features for validation of aerial interpretation and identification, then he has a project that he can connect Michael. Michael and Kevin said they would connect offline.

Julie Reichert-Nguyen commented that she and Michael met about the Hydronet network and the potential to inform one of the CRWG's climate science needs focused on developing a flooding indicator that is published in the CBP's Science Needs Database. She added that there may be opportunities for the CRWG to help with site selection of additional monitoring sites, depending on funding for the Hydronet effort. Michael also added that due to the low-cost, private residents have also offered to buy their own/finance them.

3:20 PM **Opportunities, Partner Announcements and Wrap-up [10 Minutes]**

- *The Department of Defense Chesapeake Bay Program's Literature Review on carbon sequestration of best management practices is complete. Jamileh will ensure that the review is sent to the CRWG's distribution list.*

3:30 PM **Adjourn**

The next workgroup meeting is being planned for August 15, 2024 (subject to change)

Participants:

First Name	Last Name	Affiliation
Allison	Brown	MDE
Amy	Freitag	NCCOS
Arianna	Johns	VA DEQ
Arianna	Johns	VA DEQ
Ben	McFarlane	HRPDC
Breck	Sullivan	USGS
Caitlin	Bolton	MWCOG
Carol	Bean	
Debbie	Herr Cornwell	MDP
Elizabeth	Andrews	UVA
Emma	Corbitt	HRPDC
Erik	Meyers	The Conservation Fund
Fredrika	Moser	MD Sea Grant
Jamileh	Soueidan	CRC
Jeremy	Hanson	CRC
Jim	George	MDE
Joe	Rieger	Elizabeth River Project
Joel	Carr	USGS
John	Denniston	MDOT
Julie	Reichert-Nguyen	NOAA
Karen		
Katie	Davis	EPA
Katie	Brownson,	USFS
Kayle	Krieg	MD Sea Grant
Keith	Bollt	EPA
Kevin	Du Bois	Dod
Kevin	Schabow	NOAA
Krista	Romita Grocholski	MARISA/RAND
Lena	Easton-Calabria	MARISA/RAND
Mark	Bennett	USGS
Michael	Maddox	UMD
Molly	Mitchell	VIMS
Nicole	Carlozo	MD DNR
Peter	Tango	USGS
Sierra	Hildebrandt	NOAA
Taryn	Sudol	MD Sea Grant
Taylor	Woods	USGS