Chesapeake Bay Program
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Climate Resiliency Workgroup

August 15th, 2022
1:30-3:30 PM EST

Event webpage:
https://www.chesapeakebay.net/what/event/climate_resiliency_workgroup_meeting_august_2022

Minutes

Action Items:

- For Strategy Review System: Julie and Jamileh will share the Jamboard discussion with the workgroup as well as a blank Jamboard where workgroup members and interested parties can add additional responses to the discussion questions presented at this meeting.
- For GIT-Funded Marsh Adaptation Project: Julie will look into how we can best share the products (i.e., the Coastal resilience tools compilation document, matrix, and report) from Jackson Martingayle's internship and research with those interested.
  Julie responded that they could look into the best way to share his internship products
- For future CRWG Meetings: Julie will connect with Taylor Woods and Kelly Maloney to present more on their research during a future CRWG meeting.

1:30 PM **Welcome, Opening Remarks, and Announcements – Mark Bennett, Chair (USGS) & Julie Reichert-Nguyen, Coordinator (NOAA)**
Focus of meeting:

- *This meeting will kick-off the Climate Resiliency Workgroup (CRWG) two-year Strategy Review System process. We will be providing an overview of the process, reviewing progress made on the current workplan action items that pertain to our **Monitoring and Assessment Outcome**, and discussing key components pertaining to the Narrative Analysis that will be submitted to the Management Board as a part of this process. During the CRWG September 19th meeting, we will have the SRS progress review of the Adaptation Outcome workplan actions.*
- *Presentation by Jackson Martingayle on his project assisting the CRWG GIT-Funded Marsh Adaptation project, conducted as a part of the NCBO Internship.*

Announcements:

- Kelly Maloney and Taylor Woods—notification of USGS research project on climate/land-use change for non-tidal streams.

Summary

Julie began the meeting by briefly describing the Strategy Review System (SRS) process to the workgroup. She explained that this process occurs every two years and is intended to help workgroups and Goal Implementation Teams review the progress made on their current workplans (i.e., Logic and Action Plan) and develop their next two-year workplans. She stated that the goal of this meeting was to review the progress made on the workgroup's Monitoring and Assessment Outcome and discuss how to quantify progress and understand the barriers to success.

Julie then briefly described the work Jackson Martingayle presented on later in the meeting. This work reviewed different Coastal Resilience Tools to understand the metrics that are that different regional partners and groups are using to define resilience and target projects.

Mark Bennett welcomed everyone to the meeting and added to Julie's remarks that he is hoping that those in our workgroup and interested parties will help provide feedback throughout the SRS process.

Lastly, Julie introduced Taylor Woods from USGS, who provided a quick summary of the research she is working on regarding stream condition and impacts from climate change. Julie added that the workgroup is planning a meeting tentatively set for the fall that will welcome folks to come and present on their research efforts. Taylor started by stating that she works for the Eastern Geological Climate Center. Her background focuses on inland fish and macroinvertebrate communities. She is currently investigating how land-use and climate impacts stream biodiversity and is working on. This work includes disentangling specific mechanisms that impact predicted stream changes and biological conditions. To achieve this they are modeling potential fish distributions under different climate and land-use change scenarios and incorporating functional trait information to identify which traits might predispose taxa to greater sensitives. In addition to functional traits, they are researching other biological endpoints including invasive species and biological stressors and how climate change could impact non-tidal fish phenology (e.g., modeling changes in migration timing or the availability of spawning or nursing habitat). Lastly, they are a part of a larger research group that investigates the impact of climate change on other stream domains (e.g., water temperature, water quality, stream flow, and geomorphology). The objective of reaching out to the CRWG was to get feedback on some ongoing projects and to see if their research aligns with any of the workgroup efforts. Julie thanked Taylor for providing this brief overview and mentioned that Kelly Maloney, in the same research team, has presented their work before and that there is an opportunity to connect with the Healthy Watersheds GIT on some of the work they are doing. Cassie Davis asked in the chat where in the watershed this research is occurring. Taylor replied that they are looking Bay-wide encompassing all major river basins - at sites with long-term monitoring data and predicting conditions at all non-tidal habitats including unsurveyed streams.

1:40 PM **Chesapeake Bay Resilience Tool Review (Jackson Martingayle, NOAA Intern)**

- Jackson Martingayle, the NCBO Climate Intern for summer 2022, will be presenting on his project involving the review of resilience metrics/mapping tools. His project supports the CRWG's GIT-Funded Marsh Adaptation project. This review includes coastal resilience mapping tools published by governmental, jurisdictional, and nonprofit partners to identify commonalities and differences between the tools metrics and to identify which tools would be most useful for targeting specific locations for tidal wetland restoration projects.

Summary

Jackson worked as the NCBO Climate Intern for the summer, reviewing coastal resilience tools as a part of the GIT-Funded Marsh Adaptation project. His previous research at Louisiana State University focused on mangroves and marsh accretion rates. Through this internship he wanted to gain experience in working on the planning side of restoration. This research supports one of the main goals of the Marsh Adaptation project, "connecting resilience and social vulnerability metrics for targeting marsh restoration projects." The purpose of reviewing these metrics was to assess their similarities and differences in an effort to understand the tools' utility when targeting marsh restoration projects. This review also gives insights into which metrics other organizations use to define resilience.

Resilience tools are GIS-based programs that combine different data sources into metrics to determine the areas of land likely to be most resilience in the face of climate change, particularly in regard to sea level rise. These tools vary in spatial resolution, methodology and data sources. The tools that were analyzed for this work were either jurisdictional (i.e. MD Greenprint, ConserveVA, and AdaptVA) or regional/national (i.e. The Nature Conservancy [TNC] Resilient Lands Tool [including the coastal sites tool], USGS Coastal Change Hazards Portal, NOAA Sea Level Rise Viewer, and CBP Restoration Targeting Combined Tools [under development]).

The methodology for reviewing the tools are as follows. Jackson recorded metrics and layers in a resilience tool compilation document. He then identified sources of data and GIS files when available. He then summarized the findings into a matrix table which shows which tools incorporate which metric, as denoted by color coded cells. Finally, he summarized his findings in a report, comparing the tools.

The compilation document was a deep dive with extensive explanation of each tool. This includes the agency that developed it and point of contact, the incorporated metrics, data sources, methodology, limitations of the tools, and notes regarding its development and relevance to tidal marsh restoration. The matrix table was a visual representation of the resilience tools and depicts where the tool integrated individual data layers to assess resilience (i.e. utilized multiple metrics) versus having an individual data layer (i.e. one metric) that could overlay with other metrics. The final report was a brief summary of the compilation document

and the matrix spreadsheet, including an overview of each tool, comparisons, discussion of metric utility for targeting marsh adaptation projects, and possible improvements to the tools.

Jackson then reviewed his observations that he made about these tools throughout his research. He found that areas available for marsh migration is a common metric amongst these tools, however the way the area is determined changes based on which tool. Alternatively, both AdaptVA and the TNC tool used land use instead of marsh migration space, as a means of determining the likelihood of migration occurring. Jackson found that sediment availability was not a common metric among the tools; the TNC tools were the only ones that incorporated this. It is an important metric to include, as marshes depend on sediment accretion to survive. Organic accretion is not likely to keep up with sea level rise, so locating restoration projects with enough sediment loads is important for the marshes' resiliency. Additionally, tidal range was incorporated in a handful of tools; Jackson argued that it's an important factor to include as tidal range varies widely throughout the Bay and directly influences a marsh's resiliency to sea level rise. Lastly, when examining habitat hazard mitigation, a handful of the tools examined how different habitats interacted with erosion rates and wave power; incorporating this metric accounts for the different protection levels that habitats provide. Jackson added that he marked erosion rate and wave power as two separate metrics on the spreadsheet, but they are related; erosion rate might be more comprehensive, though, as it takes into account impacts from currents and sediment redistribution as well.

Jackson then reviewed his overall conclusions from this research. He found that data and methodology accessibility lacks in some tools (e.g., ConserveVA and CBP Restoration Targeting Combined tool). The best tools to use change depending on location, meaning that a combination of these tools will likely be useful depending on which metrics the CRWG designates the highest priority. The TNC Resilient Lands tool is likely to be the most useful tool for initial targeting tidal marsh restoration in the Bay, however the state tools provide finer scale recommendations for local efforts. Finally, the next steps include having the tool creators verify these findings, since some of the tools have models built into them that utilize metrics that were not indicated in the provided methodologies.

<u>Discussion</u>

Julie thanked Jackson for presenting and for working with the CRWG this summer. Breck Sullivan then asked Jackson if he found certain tools that were more user friendly especially in how it discusses what layers and metrics are incorporated. Jackson found that MD Greenprint was user friendly and it was easy to find the data and methodology. Furthermore, this tool was clear about the layers and metrics incorporated and the differences between the layers and metrics. He mentioned that the TNC tool was initially difficult to navigate as it is very comprehensive and wide ranging, so there is a learning curve in determining which layers and metrics are used for specific analyses. He underscored that data accessibility and clear guidance on how to use the tools are what made them user friendly. Jim George requested access to Jackson's findings; Julie responded that they could look into the best way to share his internship products. Julie also mentioned that the CRWG is planning on inviting the creators of some of these tools to present at the October meeting.

1:55 PM **Overview of the Strategy Review System and Key Deadlines (Jamileh Soueidan, NOAA/CRC)**

- Jamileh will present an overview of the Strategy Review System. Every two years the workgroup assesses the progress made on the current workplan for the climate monitoring and assessment and adaptation outcomes and develops a new workplan to guide the next two years. This presentation will review the steps of the process and the key upcoming deadlines.

Summary

Jamileh presented on the Strategy Review System (SRS) process and the important deadlines. Currently, the climate cohort is beginning their SRS cycle. SRS, which occurs every 2 years, is an adaptive management process that works towards achieving the outcomes of the Chesapeake Bay Watershed Agreement. This process provides opportunities for input and promotes broad partnership learning. This process allows us to learn while doing- we are able to take action, monitor results, assess our progress and adjust our efforts as needed.

SRS is a marathon, not a sprint. Each cycle begins with a review meeting and includes Quarterly Progress Meetings (QPM), where cohorts (i.e. groups of GITs and workgroups) report their progress to the Management Board (MB), explain their challenges and request action or assistance. In turn, the MB reviews progress toward each of the outcomes of the Chesapeake Bay Watershed Agreement and supports necessary adaptations to the partnership's work.

The climate cohort has many key dates and deadlines approaching this fall. The pre-QPMs, which will assess progress on our current workplan are taking place during the August and September workgroup meetings. The cohort then has their SRS Dry Run, which is a practice presentation for the MB, on October 20th. Then we will present our progress and assessments to the MB on November 10th. Materials for the Dry Run are due October 13th and for the QPM October 27th.

Jamileh then reviewed the materials that are due to the MB at the QPM. The Logic and Action Plan is a workplan that illustrates the link between the factors that could impact the partnership's ability to achieve an outcome and the actions it is taking to manage them. The focus of the August and September CRWG meetings will be to assess this workplan to understand progress made on the actions for the Monitoring and Assessment and the Adaptation Outcomes; each action is color coded to represent progress. Green means that an action is on track or complete, yellow means that there are slight delays, red means major delays or obstacles, and purple (which is unique to our workgroup) indicate placeholder actions that were included for actions that might be developed. Actions with a diamond next to them indicate priority actions as determined by the workgroup or CBP, and actions with a triangle indicate secondary workgroup actions, which were to be addressed if resources and capacity allowed. Jamileh mentioned that there will be no new actions discussed at these meetings and a separate meeting will be held to identify new actions for the next Logic and Action Plan.

The Narrative Analysis is a summary of findings from the Logic and Action Plan, and a description of whether new information will impact how to achieve an outcome, as well as recommended course corrections. This analysis includes lessons learned, describes successes and challenges, and describes how science, finance, and policy will influence the work over the next two years. Lastly, the presentation for the MB summarizes the information from the Management Strategy, Logic and Action Plan, and the Narrative Analysis.

Jamileh ended by stating to please feel free to reach out to her (jamileh.soueidan@noaa.gov) or Julie (julie.reichert-nguyen@noaa.gov) by email with any questions. More information about the CRWG current workplan can be found at the workgroup's website, and more information about SRS can be found on Chesapeake Decisions.

2:05 PM **Review of Progress on Priority Workplan Actions for the Monitoring and Assessment Outcome (Julie Reichert-Nguyen, NOAA)**

- CRWG and STAR Staff reviewed the current workplan and discussed progress made on each action item from the previous two years. This presentation will review all actions associated with the CRWG Monitoring and Assessment Outcome.

Summary

Julie presented on the progress made on actions that support the CRWG Monitoring and Assessment Outcome, including the accomplishments and barriers and obstacles that were encountered. She mentioned that September's meeting will focus on the Adaptation Outcome and associated actions. She also highlighted the fact that many Monitoring and Assessment Actions feed into the Adaptation Actions, so there are some Adaptation actions in this presentation.

Julie then briefly reviewed the language of the two outcomes. The Monitoring and Assessment Outcome aims to continually monitor and assess the trends and likely impacts of changing climatic and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies, programs and projects. The Adaptation Outcome aims to continually pursue, design, and construct restoration and protection projects to enhance the resiliency of Bay and aquatic ecosystems from the impacts of coastal erosion, coastal flooding, more intense and more frequent storms and sea level rise.

Julie then reviewed the three Monitoring and Assessment Factors, which describe barriers that would hinder progress. Each of the actions are then developed to address how to overcome these barriers. These three factors focused on scientific capabilities, geographic extent/variability, and complexity of the monitoring program. For scientific capabilities, the workgroup has discussed how complex it is to estimate, project, and monitor ecosystem changes as a result of climate change. For geographic extent and variability, it was emphasized that the management strategy should not focus on coastal issues alone, but address the wide range of monitoring and assessment needs region-wide; this has posed a challenge as regions

approach addressing climate change differently and there is no standard way that resilience is assessed. Lastly, the there is a challenge posed by the complexity required by this sort of monitoring. There is a need for long-term, stable monitoring which is resource intensive.

Julie then reviewed the tracking key again and how the workplan is color-coded based upon progress, before reviewing the actions associate with the Monitoring and Assessment Outcome. Action 1.1 states, to "Assess utility of climate change indicators in tracking climate resilience for water quality, living resources, habitats, and public infrastructure and determine strategy for updating prioritized indicators." *Sub-action a* was coded green, and Julie discussed the work done with STAR and other workgroups to work with the MB in prioritize which climate change indicators to focus on in connection with other outcomes. Currently, the web-text for Chesapeake Progress is being updated to better reflect this prioritized effort. *Sub-action b* was coded yellow as there was a descriptive list developed for prioritized climate change indicators with preliminary information about timeframes and responsible parties, however there needs to be more capacity to create an implementation plan for each one.

Action 1.2 (primary action) states, to "Coordinate the development of climate change indicators in connection with clear management objectives with corresponding workgroups to inform climate resilience activities related to ecological and community impacts." This action aims to refine the workgroup's indicators to better connect with other Chesapeake Bay Watershed Agreement outcomes that address living resources like fish and submerged aquatic vegetation. All sub-actions (*a-d*) were coded green. *Sub-actions a & c* focused on development of a Bay Water Temperature Change Indicator related to Fish and SAV; progress was made through the STAC Rising Water Temperature workshop, as well as discussions between the workgroup and the Integrated Trends Analysis Team (ITAT). *Sub-action b* focused on a stream temperature change indicator as it relates to Brook Trout; progress was made through the upcoming Fall 2022 USGS data release of multi-agency stream temperature compilation database and through the Healthy Watersheds GIT-developed "proxies" for stream temperature by expanding the use of a dataset related to brook trout and rising stream temperatures. Lastly, *sub-action d* focused on a sea level rise indicator related to marshes; currently the Wetland Workgroup and Habitat GIT are completing the GIT-funded Marsh Data Synthesis project, which include a comparison of marsh migration models and recommendation of data.

Action 1.3 (primary action) states, to "Increase capacity to better understand sea level rise (SLR) impacts to coastal marsh habitats and their ecosystem services." Both sub-actions (*a & b*) were coded green. Efforts that supported s*ub-action a* included supporting the Wetland Workgroup's GIT-funded Marsh Data Synthesis project; the deliverables should be available this September and include a marsh metric data review, a marsh migration model comparison, and data synthesis methodology. Efforts that supported *sub-action b* include inviting subject matter experts to present during the CRWG monthly meetings (e.g. Mar, Sep, and Dec 2021 meetings) and attending/participating in workshops including the the Resilient Coastal Wetlands and Communities Multi-Regional Workshop.

Action 1.5 (primary action) states, to "Coordinate with the Modeling Workgroup and the Water Quality GIT to support the application of TMDL climate change projections." *Sub-action a* was color coded green, as the CRWG April 2021 meeting supported the action by focusing on reviewing the climate model narrative language presented by the Modeling Workgroup and providing suggestions on the language for clear interpretation. *Sub-action b* was color coded purple; at the time the current workplan was developed, there was potentially a need for CRWG assistance in preparing the TMDL climate change model projections for 2025. However, the Water Quality GIT deciding to hold off on applying these projections for 2025.

Action 1.6 (primary action) states, to "Support the Water Quality GIT on BMP climate resilience assessments needed to update Watershed Implementation Plans." *Sub-actions a* and *b* were color coded green and was support through CRWG's coordination with the Water Quality GIT on the Virginia Tech BMP report, which provided a systematic literature review of climate change impacts to BMP performance and watershed processes. *Sub-action c* is color coded yellow, as follow-up meetings after the release of this report are currently in development but on hold until the U.S. EPA Request for Applications on this topic is released.

Action 2.3 (primary action) states, to "Identify blue carbon science and monitoring needs to apply existing blue carbon crediting protocols to support climate resilience activities." *Sub-action a* was color coded green as the 2021 NOAA Climate Internship Position, in partnership with VIMS, supported this action; the intern completed a review of exiting blue carbon crediting protocols from VERRA and identified the data and science needs to implement the protocols. However, *sub-action b* is color coded yellow, as we need to formulate next steps for this information. The identified science needs were shared with the Monitoring Workgroup to include in the monitoring program review that was requested by the Principals' Staff Committee. CRWG is lacking the capacity to further explore the implementation of blue carbon financing projects.

Action 2.7 (primary action) states, to "Utilize the Chesapeake Bay Program's SRS process to conduct a biennial review of the Climate Resiliency Workgroup and assess priorities." *Sub-action a* is color coded yellow, as the workgroup began developing a charter that would describe the workgroup's role, membership contributions, participation benefits, and operating principles, but it was never completed; the effort was put on hold to better understand the needs from the Climate Change Executive Directive. *Sub-action b,* which is coded green, is currently being supported through this SRS cycle; the workgroup is in the process of developing their next workplan and updating their management strategies for the next two years. *Sub-action c,* which is coded green, was supported through providing the Principals' Staff Committee with monitoring needs and providing science needs for the Strategic Science and Research Framework. *Sub-action d* was color coded yellow; there was progress made through regional coordination on marsh resilience projects, but the workgroup still needs to identify a coordination process where the MB identifies how their organizations can assist. Lastly, *sub-action d* was color coded yellow; the workgroup has begun developing a process for prioritizing climate-related requests from the Bay Program workgroups for CRWG assistance, but the process is not formalized. This process will be incorporated into the charter as it is developed.

Julie then reviewed Actions 1.4 and 1.7, which were not color coded as they are secondary actions as determined by the workgroup. Action 1.4 states, to "Increase capacity to better understand increased precipitation and warming temperature on SAV." Progress has been made on this action through the GIT-funded project through STAR, which aims to understand climate impacts on SAV by evaluating model outcomes and potential SAV recovery trajectories under various climate scenarios. The report should be available this December, and the CRWG will coordinate with the project leads to present their findings at a meeting. Action 1.7 states, to "Support efforts of STAR to promote use of climate science data in existing tools and building collaborative data partnerships (EnviroAtlas/Ecosystem Services)." This action was supported through the October 2021 CRWG meeting, where the EnviroAtlas Team presented their tool and the April 2022 CRWG meeting, where John Wolf presented on the Chesapeake Bay Environmental Justice and Equity Dashboard and the CBP targeting tool that is under development. Julie underscored that the workgroup still lacks the capacity to follow through and follow up with these secondary actions, but it is something to think about as the workgroup develops their next workplan.

Julie highlighted the themes that she identified while reviewing the actions that support the Monitoring and Assessment outcome. Many of these actions focused on sea level rise's impact on marshes and marsh migration. She also recognized the work being done to develop climate indicators that are related to natural resources, such as tidal wetlands, fish habitat, and SAV, and have management utility. There is work that focuses on blue carbon and carbon sequestration. She identified a theme around targeting information related to ecosystem services and environmental justice. Lastly, there is an overarching theme of finding the capacity to do the work.

She then introduced the discussion activity that would be taking place. This activity aims to get insights and thoughts from the workgroup about how to quantify progress and understanding barriers to success. She mentioned that this discussion will help develop the narrative analysis. The questions that were posed to the workgroup are outlined below.

2:20 PM **Facilitated Discussion for Progress on Current Workplan, Lessons Learned, and Directions of the Team**

- Quantifying Progress:
  - Through our involvement with our factors (found at the top of our workplan), what are our lessons learned? How have our actions made progress towards our outcomes?
  - What steps has our workgroup taken to ensure that our actions and work will be equitably distributed and focused in geographic areas and communities that have been underserved in the past?
  - What is our key message to the Management Board regarding our progress?
- Understanding Barriers to Success:
  - List any external developments (scientific, fiscal, policy) that could impact this group's focus/priorities in the next two-year cycle.

- What do you view as this Team's greatest challenge(s) moving forward?

Discussion

Julie introduced the interactive discussion portion of the meeting, which was documented through jamboard (see below). There were a total of 5 questions for participants to respond to, with 10 minutes allotted for each question.

The jamboard discussion began with the question "Through our involvement with our factors (found at the top of our workplan), what are our lessons learned? How have our actions made progress towards our outcomes?" (Slide 1). On this slide, the three factors presented at the beginning of the previous presentation were listed on the left side of the slide. Responses included needing more momentum in building climate considerations into other collaborating workgroup efforts. Additionally, it was noted that there is a need to continue supporting the work that is done to integrate multiple stressors and "predictions" to generate useful predictors; Julie added that this ranges wider than multiple stressors as a result of climate change but other stressors such as pollutants and excess nutrients that can impact living resources. The STAC Rising Water Temperature Workshop helped focus management recommendations; Julie mentioned that the report is currently wrapping up and will be out to participants to review soon. Another point that was made was that indicators require a lot of time and resources and there is a need to understand how best to use these indicators with partner resources. A point was made to address how monitoring needs are included in the PSC Monitoring Report but there is a need for the CRWG to create/design a plan in an effort to get the PSC to commit to the needs.

Julie posed a follow-up question to the group for input; she mentioned that a lot of time and resources are spent developing climate change indicators, and over the past two years there has been an effort to identify the utility of the indicators for management purposes. This effort is time and resource intensive, and while there was progress made, she wanted to hear from the workgroup about their perspectives on the efforts and gauge how much time they think we should be spending on indicator development. She posited that another way to think about next steps in this work would be to shift to conducting useful analyses that would be helpful to our partners; an example she gave was discussing the current efforts to create a way to target wetland restoration projects. Jim George responded by highlighting the efforts to collaborate between Virginia, Maryland, and the Bay Program on ocean acidification/carbonate system monitoring. He mentioned that might be an indicator area that would warrant attention. Julie added some clarification to her question, stating that the Bay Program utilizes indicators to track progress towards the outcomes; this is a challenge for the CRWG in the sense that the outcomes the workgroup are tasked with are qualitative in nature. She mentioned that there are efforts to create indicators with greater utility for decision making and project targeting. Jim asked if there is a current effort to organize and present the ones that are currently being tracked and to have a dashboard to overlay these different indicators. Julie responded by mentioning the work that John Wolf and the CBP GIS Team are conducting, creating the CBP Diversity Dashboard, where they are integrating various resilience metrics with environmental justice information. Julie did agree with Jim in that these efforts are time consuming and

resource intensive, especially when establishing a maintenance schedule to keep the indicators up-to-date. Julie said this will be addressed while the next two-year workplan is developed, because determining the most effective way to track progress posies a challenge. Jim also asked if an overview available for the climate efforts that are taking place throughout the partnership and in other workgroups and GITs? He mentioned the Bay TMDL work and Urban Stormwater work that incorporates climate considerations and how there is progress being made in other areas of the partnership towards climate resiliency.

Allison Ng responded to Julie's question about indicators, and she asked if the workgroup knew how much work is being done in this area? She reiterated the language of the Monitoring and Assessment Outcome and mentioned that a lot of the indicators are monitoring physical parameters in the environment (e.g. temperature and precipitation), however she wondered if there are other indicators that can be developed that are work-related and easier to measure? Julie responded that there has been some discussions regarding the Adaptation Outcome and tracking efforts like whether or not a jurisdiction has a resilience plan in place; there would need to be an efficient way to report it or establish a self-reporting protocol. She mentioned that a lot of the Monitoring and Assessment Outcome indicators address impacts, but there needs to be a point where the indicators assess resilience work being done. She provided the example of determining the number of jurisdictions that have policies established to preserve marsh migration.

The second discussion question stated, "What is our key message to the Management Board regarding our progress?" (Slide 2). Some responses addressed that while the workgroup has made progress over the past two years, the outlook is off course and there needs to be an increase in capacity to support all the climate efforts. Another comment stated that working with other workgroups and partners is a must to make progress and that there needs to be coordinated efforts across groups and open communication. Julie added that the CRWG does have limited resource and the workgroup is a science support team, so it is hard to tackle all the different climate efforts occurring within the Bay Program, especially in regard to policy and local engagement. Another response highlighted that there needs to be climate monitoring for multiple outcomes to see if climate change will impact the ability to meet those outcomes. Another respondent mentioned that they believe the workgroup is on track, through the current monitoring efforts that are in place. Julie highlighted that there are two differing opinions about whether or not the workgroup is on track and invited the respondents to provide their insights. Allison Ng responded that she thinks the workgroup is on track in that the workgroup is continually monitoring climate impacts; this goal of this outcome is not to reduce the impact of climate, which falls under the Adaptation outcome. Breck Sullivan stated that she framed the question in regards to the narrative analysis, where it asks about the outlook of meeting the outcome; she was thinking in the long-term there needs to be more effort in developing resilience metrics that are not just physical metrics. Julie stated that there has been a lot of progress made over the past two years, largely in part to the effort made to increase capacity through collaborative, cross-workgroup projects and onboarding a full-time staffer. Julie highlighted that there is still work that needs to be done in determining how to assess resilience success; she stated that monitoring trends for the Monitoring and Assessment

Outcome should feed into the Adaptation Outcome to help with this effort. She mentioned that this is not a two-year action, but will take time to develop a process by which to measure resilience success. She also underscored that long-term monitoring is key to assess trends, however it is costly.

Cassie Davis asked where the request for the indicators came from. Julie responded that the indicators are part of the CBP as a whole. CRWG is responsible for two outcomes, which are qualitative in nature and hard to track with indicators. She stated that the Management Board is responsible for the request to develop these indicators. Cassie then followed up by asking who the current audience for these indicators is. She stated that she is trying to understand who the end-users of these indicators are. Julie stated that currently there is an effort to connect the indicators to other outcomes across the Bay Program. Julie mentioned that there needs to be more cross-workgroup coordination, and through those workgroups collaborating with jurisdictional partners and gaining their insights. She highlighted that the message to the MB could be that the workgroup needs to sort out these collaborative efforts to create effective indicators. Jim George also responded that much of what the CRWG does is to corral the efforts of other workgroups. He stated that the workgroup is "not like a brick, rather more like the grout between the bricks," when it comes to bringing climate considerations to the discussion.

Peter Tango added a comment in the chat about this discussion around indicators. He mentioned that trends that provide insights into trajectory would also be evaluations of success in building resiliency; he commented that it would be changing the pace of change. Julie felt that this was an interesting perspective. He mentioned that there may be a way to track how resilience projects are changing the rate of climate change at a local scale. Allison responded to Peter wondering about the lag time between an interventions and seeing additional resilience realized. Peter responded that it depends on the scale of the project, where at larger scales it can be harder to detect the impacts. Breck also added in the chat that ITAT, through their Bay water temperature indicator, is working on identifying rates of change in water temperatures.

The third jamboard question stated, "What steps has our workgroup taken to ensure that our actions and work will be equitably distributed and focused in geographic areas and communities that have been underserved in the past?" (Slide 3). Julie mentioned that this is a new question that was incorporated into the narrative analysis. CRWG has started to think about incorporating a DEIJ focus into the work, and will be addressed as the next workplan is developed. Julie did mention that identifying steps towards this is probably a challenge since the actions were not set up to address this when the last workplan was developed. Julie added a note to the jamboard stating that in the recent meetings, the work group has been trying to connect resilience activities with environmental justice metrics. This idea is built into the GIT-funded Marsh Adaptation project as well. Another comment on the jamboard mentioned reserving funding during projects to compensate underserved and underrepresented groups who participate; a barrier to participation in projects is lack of compensation as these groups might not have the resources to be unpaid during the time they offer. Elizabeth Andres commented that this is one area where the communication could be better. Julie mentioned

that this jamboard will be shared after this meeting so workgroup members and interested parties can add more responses to the question as they have the opportunity to think it over.

The fourth jamboard question stated, “List any external developments (scientific, fiscal, policy) that could impact this group’s focus/priorities in the next two-year cycle” (Slide 4). Responses included the Climate Change Executive Directive, the Infrastructure Law, Phase 7 of the Chesapeake Bay Watershed Model, the restructuring of the staffer support program through the CBP, and the effect of climate change on BMP effectiveness. Julie highlighted the CRWG is not structured from a capacity standpoint to take lead on the Climate Change Executive Directive actions, but Julie mentioned that there are some actions that the workgroup could support. Cassie Davis asked if the Climate Directive is being housed by any one workgroup. Julie responded that from her understanding different workgroups and GITs will be tasked with taking lead on specific actions so that the Climate Directive workplan does not fall solely to one party. Julie also highlighted the bipartisan Infrastructure Law; there are many new funding opportunities from this law that the workgroup can capitalize on, especially in the work being done with wetland restoration and natural infrastructure. Julie mentioned that it is worth talking with the MB about how best to position the Bay Program to be competitive for some of the national grant programs developed through this funding.

The last jamboard question stated, “What do you view as this Team’s greatest challenge(s) moving forward?” (Slide 5). Responses include capacity, prioritizing work, evolving science, making progress on a complex topic with limited resources when there are no individualized requirements to participate, having grant writers available to readily help answer questions or help partners, and coming to a consensus on how to assess progress. Julie highlighted that capacity is something to think about as the new workplan is developed; she stated that the workgroup needs to decide where and how to focus knowledge and expertise to make progress on the outcomes. She mentioned all the great collaborative work in the marsh migration and wetland restoration space, which will likely carry over into the new workplan. She asked the workgroup to think about how we can narrow the focus of the workplan to be most effective over the next two years as we work through the SRS process.

Julie concluded that she appreciated everyone’s insights as the next SRS cycle begins. This discussion will be helpful in informing the next workplan and narrative analysis. Julie mentioned again that the jamboard will be sent out again so that people who could not make it can still provide their insights.

Mark Bennet concluded the meeting by stating how the SRS process can be difficult for the CRWG due to the way the outcomes are structured and the way the narrative analysis questions are structured. The outcomes are qualitative by nature so measuring progress is not as easily assessed. He stated that the goal of the process is to identify actions that the workgroup wants to undertake, and that are going to move the efforts this workgroup forward and the collaborative efforts with other workgroups forward. He stated that a great way to measure progress to assess how much the CRWG is working alongside other workgroups to incorporate climate considerations. Additionally, he stated that this process allows the

workgroup to understand the barriers that the partners are running into when trying to build resilience, and is there a space for the workgroup to help overcome these barriers.

3:25 PM **Additional Announcements and Wrap-Up**

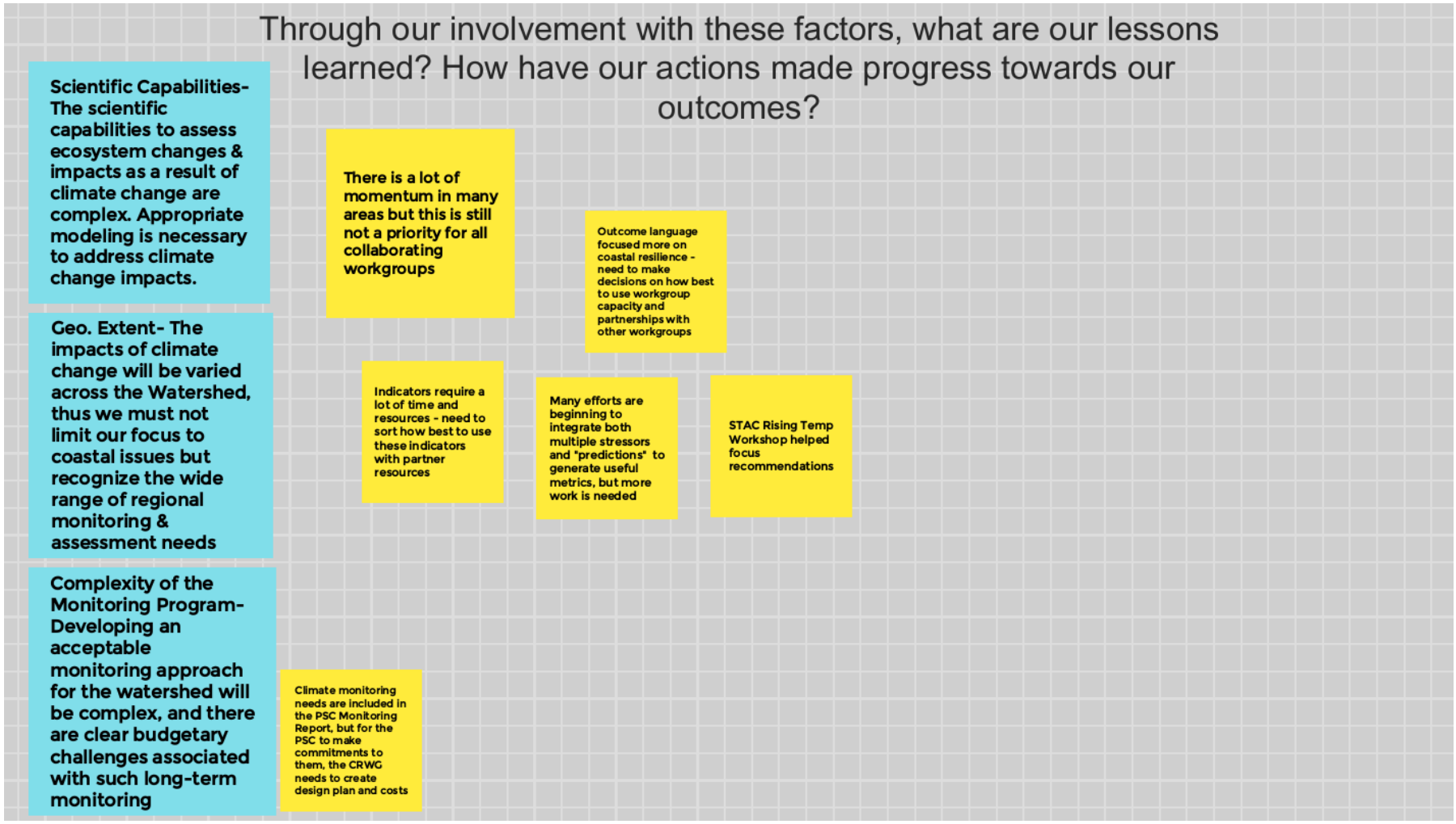
Announcements and Opportunities

- Registration for the Chesapeake Watershed Forum will open August 22, 2022. This in-person forum focuses on sharing successful tools and techniques, offer lessons and learnings from on-the-ground work, build capacities of local organizations, foster partnerships, educate on new initiatives and emerging practices, network among each other, and celebrate successes. This year, Jamileh Soueidan (CRC/NOAA) will be presenting on the STAC Rising Water Temperatures Tidal Management Recommendations.
- The 2022 GIT Funding Program is officially open. This year, the CRWG does not plan on putting forward any project proposals as we are currently putting efforts and resources towards the GIT-Funded Marsh Adaptation project that was funded last cycle.
- NOAA Climate and Fisheries Adaptation (CAFA) program is now accepting proposals for research project beginning in Fiscal Year 2023. The focus of this year's award aims to increase understanding and promote resilience and adaptation of U.S. marine fisheries and fishing communities to rapidly changing climate and ocean conditions. Letters of Intent are due **September 1st, 2022** and full applications are due **November 21st, 2022**. More information can be found on their website.

3:30 PM **Adjourn**

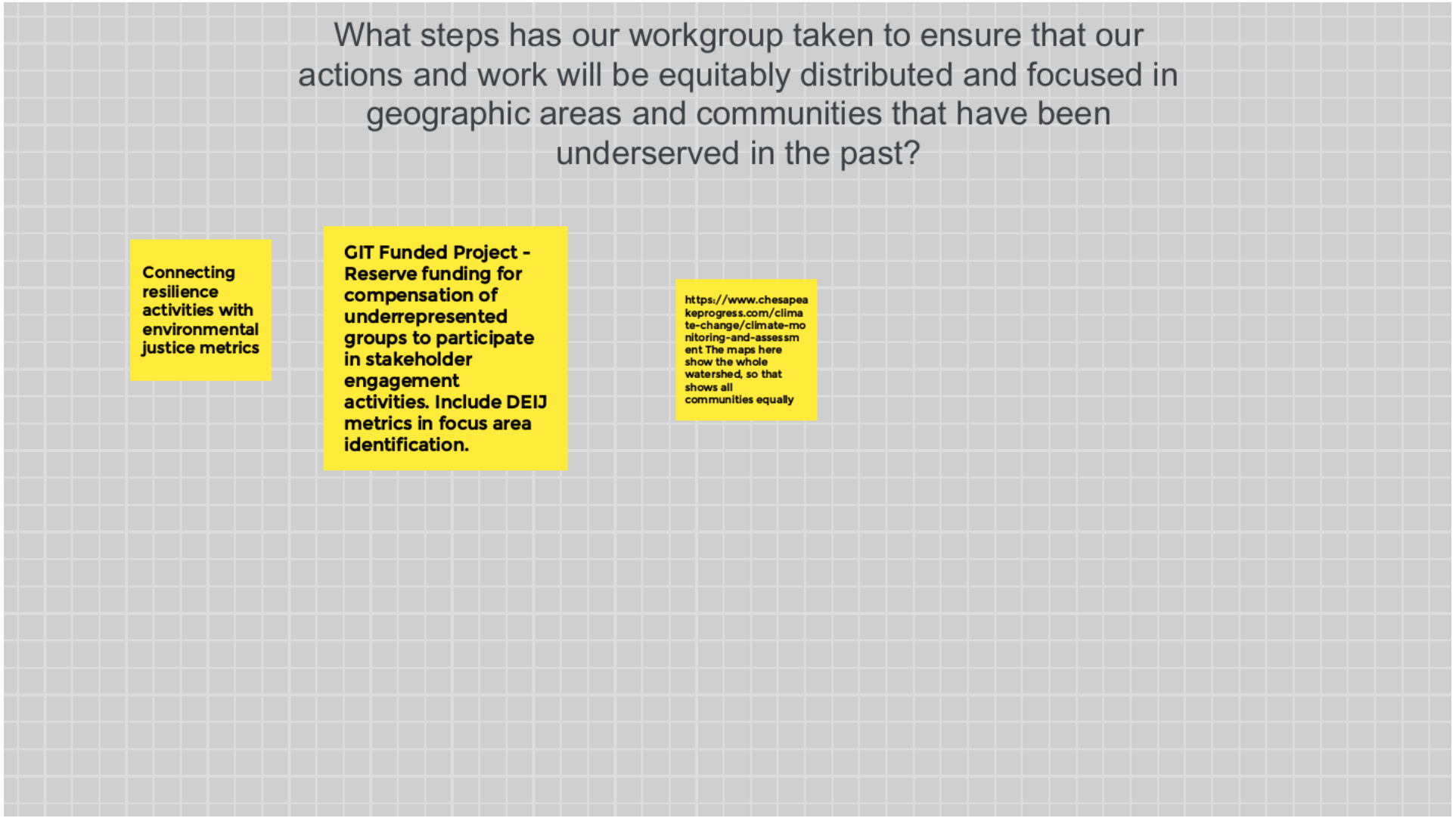
Next Meeting: September 19, 2022, 1:30-3:30 PM—SRS Progress review of the Climate Adaptation Outcome

Attendance: Adriaenne Kotula, Adrian Dascalu, Alex Gunnerson, Allison Ng, Amy Goldfischer, Anna Hamilton, Ben McFarlane, Breck Sullivan, Cassie Davis, Cindy Osorto, Darlene Finch, Debbie Herr-Cornwell, Donna Marie Bilkovic, Jackson Martingayle, Jackie Specht, Jamileh Soueidan, Jennifer Starr, Jim George, Joel Carr, Julie Reichert-Nguyen, Kristin Saunders, Laura Cattell-Noll, Lena Easton-Calabria, Lisa Dosmann, Marisa Baldine, Mark Bennet, Molly Hassett, Nicole Carlozo, Peter Tango, Taryn Sudol, Taylor Woods, Yi Liu

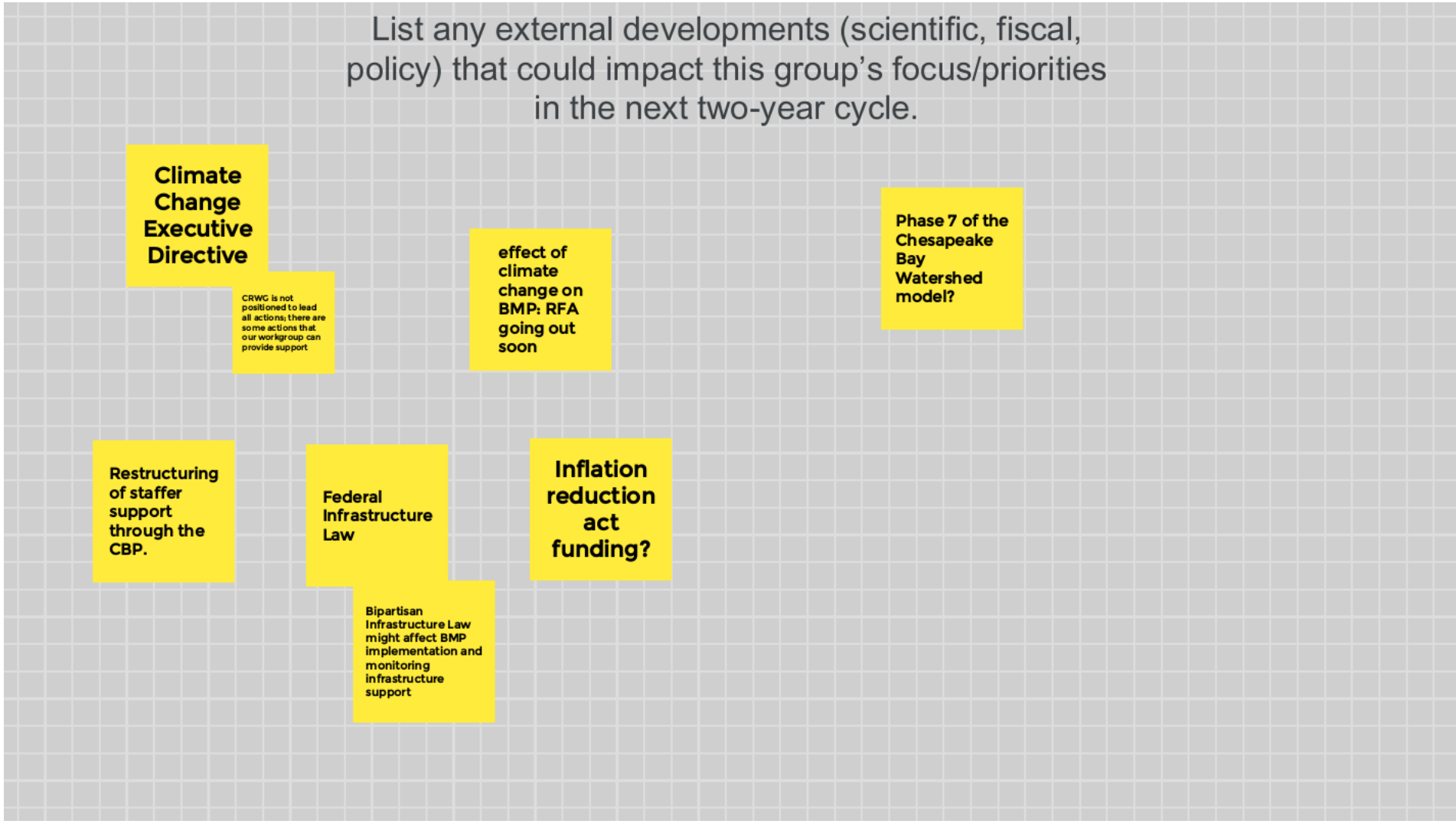

Through our involvement with these factors, what are our lessons learned? How have our actions made progress towards our outcomes?
Scientific Capabilities- The scientific capabilities to assess ecosystem changes & impacts as a result of climate change are complex. Appropriate modeling is necessary to address climate change impacts.
Geo. Extent- The impacts of climate change will be varied across the Watershed, thus we must not limit our focus to coastal issues but recognize the wide range of regional monitoring & assessment needs
Complexity of the Monitoring Program- Developing an acceptable monitoring approach for the watershed will be complex, and there are clear budgetary challenges associated with such long-term monitoring
There is a lot of momentum in many areas but this is still not a priority for all collaborating workgroups
Outcome language focused more on coastal resilience - need to make decisions on how best to use workgroup capacity and partnerships with other workgroups
Indicators require a lot of time and resources - need to sort how best to use these indicators with partner resources
Many efforts are beginning to integrate both multiple stressors and "predictions" to generate useful metrics, but more work is needed
STAC Rising Temp Workshop helped focus recommendations
Climate monitoring needs are included in the PSC Monitoring Report, but for the PSC to make commitments to them, the CRWG needs to create design plan and costs
Slide 1


What is our key message to the Management Board regarding our progress?
Working with other workgroups and partners is a must to make progress. Need for coordinated efforts across groups and good communication pathways.
In recent years, the WG has made progress, but the outlook is off course. Capacity building is crucial to support all the climate efforts.
Is there opportunity to support monitoring of on-the-ground adaptation projects (connection to tidal wetland restoration work), in addition to metric development?
Do we need to work on messaging and sharing the info that's shared on chesapeake progress: with WGs, jurisdictions, etc?
Monitoring on the effects of climate is needed for multiple outcomes to understand if the impact of climate will allow others to meet their CBP outcomes.
ing the trends and likely impacts of changing climatic and sea level conditions on the Chesapeake Bay ecosystem, including the effectiveness of restoration and protection policies programs and
restoration and protection policies, programs and projects. (So I would say you're on track with this outcome)
Cumulative impact-option to measure the impact of the work: are interventions reducing flooding, reducing heat island effect on a hyper local level, etc.

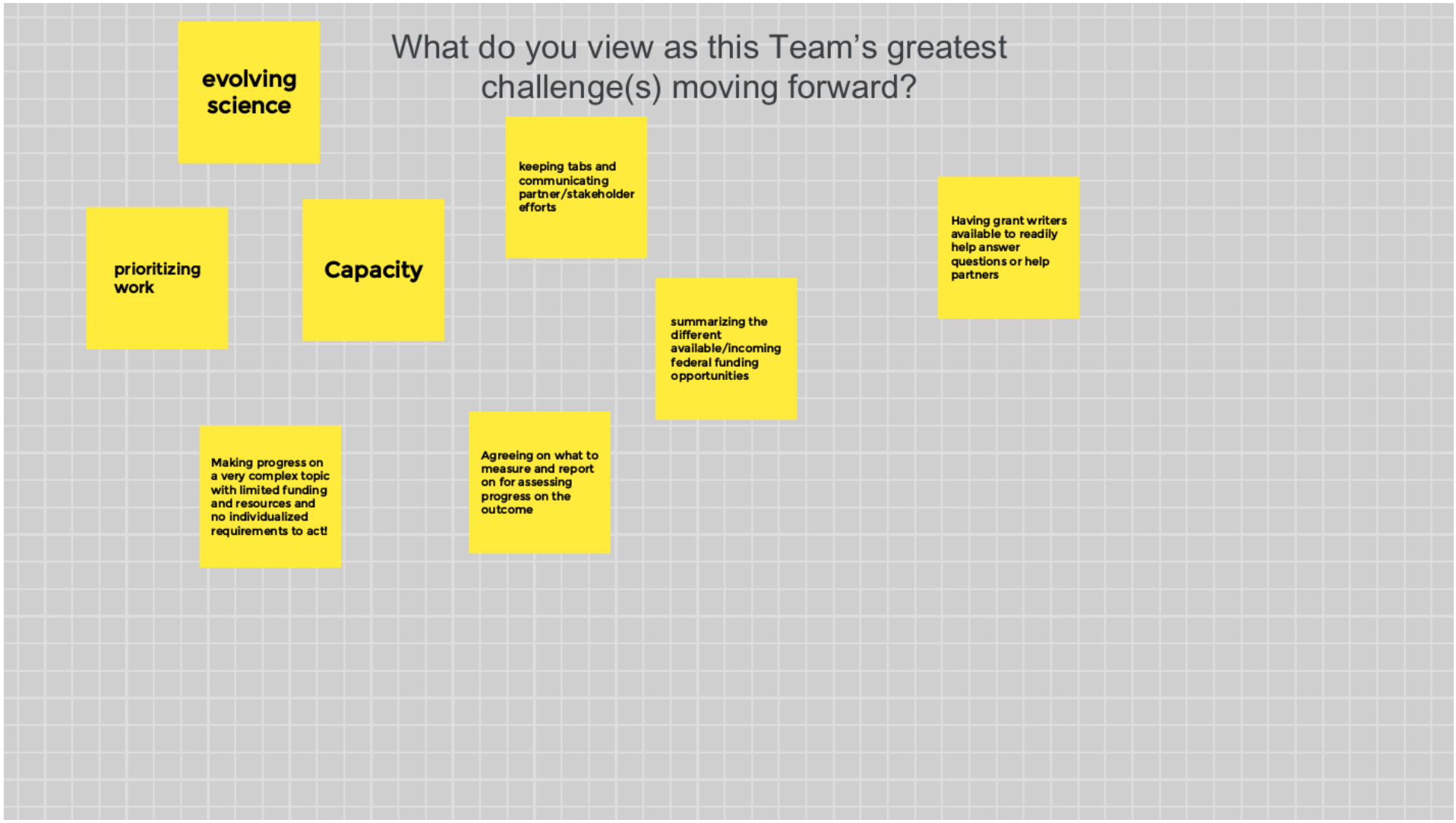
Slide 2


What steps has our workgroup taken to ensure that our actions and work will be equitably distributed and focused in geographic areas and communities that have been underserved in the past?
Connecting resilience activities with environmental justice metrics
GIT Funded Project - Reserve funding for compensation of underrepresented groups to participate in stakeholder engagement activities. Include DEIJ metrics in focus area identification.
https://www.chesapeakeprogress.com/climate-change/climate-monitoring-and-assessment The maps here show the whole watershed, so that shows all communities equally

Slide 3


List any external developments (scientific, fiscal, policy) that could impact this group's focus/priorities in the next two-year cycle.
Climate Change Executive Directive
CRWG is not positioned to lead all actions; there are some actions that our workgroup can provide support
effect of climate change on BMP: RFA going out soon
Phase 7 of the Chesapeake Bay Watershed model?
Restructuring of staffer support through the CBP.
Federal Infrastructure Law
Bipartisan Infrastructure Law might affect BMP implementation and monitoring infrastructure support
Inflation reduction act funding?

Slide 4


What do you view as this Team's greatest challenge(s) moving forward?
evolving science
keeping tabs and communicating partner/stakeholder efforts
Having grant writers available to readily help answer questions or help partners
prioritizing work
Capacity
summarizing the different available/incoming federal funding opportunities
Making progress on a very complex topic with limited funding and resources and no individualized requirements to act!
Agreeing on what to measure and report on for assessing progress on the outcome

Slide 5