Logic and Action Plan: Post Quarterly Progress Meeting

# 

**Climate Monitoring & Assessment and Climate Adaptation – 2021-2022**

*[NOTE: make sure to edit* ***pre****- or* ***post****- in the text above, to tell the reader whether this logic and action plan is in preparation for your quarterly progress meeting or has been updated based on discussion at the quarterly progress meeting.]*

**Long-term Target:** (the metric for success of Outcome)

**Two-year Target:** (increment of metric for success)

|  |
| --- |
| **Instructions:** Before your quarterly progress meeting, provide the status of individual actions in the table below using this color key. |
| Action has been completed or is moving forward as planned. |
| Action has encountered minor obstacles. |
| Action has not been taken or has encountered a serious barrier. |

Additional instructions for completing or updating your logic and action plan can be found on [ChesapeakeDecisions](http://www.chesapeakebay.net/decisions/srs-guide).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Factor | Current Efforts | Gap | Actions | Metrics | Expected Response and Application | Learn/Adapt |
| *What is impacting our ability to achieve our outcome?* | *What current efforts are addressing this factor?* | *What further efforts or information are needed to fully address this factor?* | *What actions are essential (to help fill this gap) to achieve our outcome?* | *What will we measure or observe to determine progress in filling identified gap?* | *How and when do we expect these actions to address the identified gap? How might that affect our work going forward?* | *What did we learn from taking this action? How will this lesson impact our work?* |
| Outcome: Monitoring & Assessment | | | | | | |
| Monitoring & Assessment: Scientific Capabilities.The scientific capabilities to estimate, project, model and monitor ecosystem changes and impacts as a result of climate change are complex and resource intensive. Additionally, impacts are exacerbated by non-climate stressors (e.g., land-subsidence, land use change, growth and development).Appropriate science and modeling of climate and non-climate related stressors are necessary for Chesapeake Bay Program partners to properly address climate impacts during policy planning and adaptation efforts. | Development of 7 climate change indicators on Chesapeake Progress  Development of the climate change TMDL model | Need scientific capability to monitor climate and other stressors simultaneously; need to ensure that long-term monitoring networks include key parameters to assess climate change impacts and multiple stressors; need to sustain and support long-term monitoring networks (e.g., CBP Monitoring Network, Sediment Elevation Table Marsh Studies); need adequate downscaled climate modeling data and data to develop and test models; need continued efforts to understand thresholds of climate stressors on water quality, fisheries, and habitats, interaction of multiple stressors, and quantification of co-benefits |  |  | Development of climate change indicators will depend on the quality of supporting data, the added value of the indicators for helping to understand and explain management successes, and the priorities and resources of the CBP Partnership.  CRWG is planning to develop 1-2 new climate change indicators during 2021-2022. |  |
| Monitoring & Assessment: Geographic Extent/Variability of the Watershed. The impacts of climate change will be varied across the Watershed. It is important to not limit the focus of the management strategy to coastal issues alone but to recognize the wide range of monitoring, assessment and adaptation needs throughout the region. However, the variability of the ecosystem within the Bay proper and the larger watershed presents challenges in data consistency and comparability among regions and sectors. | Scientific data collection at DE, MD, VA NERRS sites to gain a better understanding of what is happening at the reserve level and how that can be applied to the Bay as a whole  Healthy Watersheds is incorporating climate metrics and vulnerability into their assessment  Development of a Bay-wide climate resilience scorecard for tidal and non-tidal areas. | Need methods aimed to improve data consistency and comparability among regions and sectors |  |  | Currently, the CRWG does not have adequate resources to tackle both Bay and watershed climate change assessment needs across workgroups simultaneously |  |
| Monitoring & Assessment: Complexity of the Monitoring Program. Developing a monitoring program to detect ecosystem change and inform program and project response is a complex undertaking. Developing an acceptable monitoring approach for the watershed will be complex, and there are clear budgetary challenges associated with such long-term monitoring. | Data collected by NOAA Chesapeake Bay Sentinel Site Cooperative (CBSSC), CBP Monitoring Network, and others on key climate change parameters, such as water temperature. | Need institution capacity to develop and perform long-term monitoring to detect ecosystem change, and a steady funding source for such efforts; need to evaluate alternative monitoring strategies, such as use of satellite data |  |  | Outside CRWG capacity. Need to identify partners that can support monitoring needs; Monitoring Workgroup is looking into developing a STAC proposal to evaluate new technologies and new partners to enhance monitoring capacity—key climate parameters in connection with climate change indicators should be considered |  |
| Outcome: Adaptation | | | | | | |
| Outcome Adaptation: Stakeholder Engagement. Although there is acknowledgement that climate change and adaptation need to be addressed, there is a lack of understanding or agreement from stakeholders on what it means to be resilient or what constitutes resiliency, including what kind of actions support an adaptive management approach. Lack of appropriate stakeholder engagement jeopardizes acceptance of choices made about action plans and implementation strategies, introducing additional levels of social discord in an already complex environmental-economic-social landscape. If social stability is reduced, then policy effectiveness would likely be reduced. | Worked with Local Government Advisory Committee on forum that developed recommendations for local governments on what they can do to act more deliberately in addressing flooding issues from changing climate conditions.  Collaborating with CBP Local Engagement Team on identifying climate change-related local engagement needs and resources. | Need collective agreement; need coordination and collaboration among stakeholders; need willingness to discuss managed retreat as an option; need support in following up on recommendations |  |  |  | Outside current CRWG capacity |
| Outcome Adaptation: Capacity. Institutions and the private sector have a general lack of capacity to understand the science and incorporate meaningful change into plans, programs, processes or projects. Although building that capacity is paramount, it can be time consuming and costly, considering the resource constraints faced by governments and organizations and the variability in adaption approaches. |  | Knowledge of types of technical assistance/expertise needed by jurisdictions (can CRWG member organizations assist?) |  |  |  |  |
| Adaptation: Authority Governments’ and institutions’ ability to respond to climate change is also limited by legislative, policy, regulatory and other authorities. | Individual jurisdictional incorporation of climate narrative (or voluntary numerical target) into WIPs III.  States and communities around the Chesapeake Bay are taking steps to prepare or maintain their climate change adaptation or sustainability plans. | Need knowledge of institutional/regulatory barriers; need incorporation of climate change considerations across programs. |  |  |  | Outside current CRWG staff capacity |
| Adaptation: Guidance. There is currently a lack of clear science (models, tools and metrics) and guidance for the Chesapeake Bay Program, as well as stakeholders, to use to develop plans or to measure efficacy of response. The nature of on-the-ground implementation often requires certainties (e.g., hydrology, water quality, temperature, precipitation, sea level rise, coastal erosion rates) that are not yet available for a changing climate. Additionally, there is variability in institutional responses. | Ongoing research and models, tools and metric development by CBP partners | Need development of clear tools and guidance to develop plans and efficacy of response; lack of extensive information (or information dissemination) on the costs of climate change impacts in specific areas, or the cost savings and ecosystem benefits represented by specific mitigation or adaptation measures. |  |  |  |  |
| Adaptation: Collaboration. The many and diverse stakeholders and organizations that make up the Bay Program are a strength, but it also causes collaboration challenges that must be addressed in order to maximize limited resources and provide strategic adaptation approaches across the watershed. | The Climate Resiliency Workgroup meets monthly to discuss a variety of climate topics and provide a forum for information-sharing to encourage collaboration | Need to achieve strategic collaboration that maximizes limited resources; need consensus on strategic adaptation approaches that fit the impact and area of concern |  |  |  |  |

|  | Monitoring & Assessment Actions – 2021 - 2022 | | | | |
| --- | --- | --- | --- | --- | --- |
| Action # | Description | Performance Target(s) | Responsible Party (or Parties) | Geographic Location | Expected Timeline |
| Management Approach 1: Assess past and future trends in sea level, precipitation patterns, temperature and ecosystem response to climate change | | | | | |
| 1.1 | **Design monitoring and maintenance protocols to report on and implement new Chesapeake Bay Program (CBP) Climate Change Indicators and their corresponding data sets** | **a. Assess utility of proposed new climate indicators with corresponding workgroups, STAR, and the Management Board to prioritize development.**  **b. Develop a climate indicator framework to connect physical changes (e.g., sea level rise, increased precipitation, warming temperatures) with ecological and community impacts to inform resilience strategies for Chesapeake Bay Watershed Agreement outcomes.**  **c. Based on the prioritization decisions, continue to evaluate available data to develop future climate change indicators in connection with the Chesapeake Bay Watershed Agreement Outcomes related to fisheries, habitats, and water quality, including, but not limited to, a Bay Water Temperature Indicator (already indicated as a priority).**  **d. Support the proposed 2021 STAC Workshop, “Rising Watershed and Bay Water Temperatures—Ecological Implications for Ecosystem Processes Influencing Stream, River, and Estuarine Health.” Compile Bay water temperature data sources and host cross-workgroup discussion on the utility of the water temperature change indicators in connection to fisheries and habitats with relevant workgroups.** | Lead: CRWG, STAR, Status and Trends Workgroup, relevant workgroups, relevant CBP partners  NCBO: lead for Bay Water Temperature Change Indicator | Bay/watershed-wide or place-based | CRWG does not have the capacity to develop all climate-related indicators of interest. Development of these indicators will depend on the quality of supporting data, the added value of the indicators for helping to understand and explain management successes, and the priorities and resources of the CBP Partnership. CRWG plans to develop 1-2 new indicators (2021-2022). |
| 1.2 | **Maintain monitoring and maintenance protocols for the existing suite of CBP Climate Change Indicators and their corresponding data sets** | **a. Assess utility of existing climate indicators with corresponding workgroups, STAR, and the Management Board to prioritize maintenance. Archive indicators that are not included in prioritization decisions.**  **b. Determine time period that climate change indicators need to be updated and coordinate updates with the Status and Trends Workgroup the option of updating Climate Change data sets after a longer time period than one year to be able to see change due to the climate.**  **c. Collaborate with the Status and Trends Workgroup to develop maintenance plan for the existing suite of CBP Climate Change Indicators.**  **d. Explore collaboration with USGS PA Water Science Center to connect their stream temperature compilation project with updating the stream temperature indicator.** | Lead: CRWG, STAR, Status and Trends Workgroup, relevant workgroups, relevant CBP partners | Bay/watershed-wide or place-based | CRWG does not have the capacity to maintain all the climate indicators of interest. Maintenance of indicators will rely on support from other workgroups. |
| Management Approach 2: Develop a research agenda to improve understanding of climate impacts and fill critical data and gaps related to monitoring and modeling | | | | | |
| 1.3  (5) | **Increase capacity to better understand sea level rise impacts to habitats and their ecosystem services** | **a. Partnered on GIT-funding project synthesizing shoreline, sea level rise, and marsh migration data to inform wetland restoration targeting** | Lead: Wetlands; Support: CRWG | Placed-based (target area – Middle Peninsula, VA) | 2021-2023 |
|  |  | | | | |

|  | Adaptation Actions – 2021 - 2022 | | | | |
| --- | --- | --- | --- | --- | --- |
| Action # | Description | Performance Target(s) | Responsible Party (or Parties) | Geographic Location | Expected Timeline |
| Management Approach 1: Address the design and function of Best Management Practices (BMPs) under a new climate reality | | | | | |
| 1.4 (10) | **Develop a research agenda and provide estimates of associated costs to inform a potential funding plan on climate change impacts to BMP performance (function, design, placement)** | **a. Coordinate with WQGIT in identifying BMPs where climate change research is most needed**  **b. Review Virginia Tech BMP Climate Resilience Assessment Report (STAC and NOAA-funded)**  **c. Work with the Management Board to identify alternative options (e.g., jurisdictional help) in supporting a funding plan** | Lead: CRWG Support: MB, WQGIT, NCBO |  |  |
| Management Approach 2: Implement and track priority adaptation actions, their effectiveness and ecological response and lessons learned | | | | | |
| 1.5 (11) | **Track progress in climate resilience efforts and help localities identify climate resilience actions that can be taken** | **a. Support FY19 GIT-Funded project, “Bay-wide Climate Resilience Scorecard for Watershed Communities.”** | Lead: Rand, CRWG  Support:  CBP Comms Team, Jurisdictions |  |  |
| 1.6 (13) | **Assist stakeholders with “shovel-ready” design plans for adaptation projects** | **a. Support the Habitat GIT in the FY19 GIT-Funded project, “Targeted Local Outreach for Green Infrastructure in Vulnerable Areas.”** | Lead: Habitat GIT  Support: CRWG |  |  |
| 1.7 | **Expand resource capacity to implement climate adaptation projects** | **a. Identify and provide assistance on 1-2 proposals with local/regional groups (e.g., consult on project ideas, draft/review text by subject matter experts, etc.) related to applying for external funding that would allow for the implementation of climate adaptation projects.** |  |  |  |
| Management Approach 3: Continually increase knowledge about the resiliency of the Chesapeake Bay watershed, such as the impacts of coastal erosion, inland and urban flooding, more intense and frequent storms and sea level rise | | | | | |
| 1.8 (15) | **Increase understanding of science needs to apply finance strategies related to blue carbon sequestration and resilience crediting** | **a. Explore possible STAC workshop to assess available blue carbon information and identify science gaps in applying existing blue carbon crediting protocols for wetland and SAV restoration projects in Chesapeake Bay.** | Lead: CRWG, Support: Wetlands, SAV |  | 2021-2023 |
| Management Approach 4: Address the institutional capacity of the Chesapeake Bay Program to prepare for and respond to climate change | | | | | |
| 1.9  (16) | **Utilize the Chesapeake Bay Program’s SRS process to conduct a biennial review of the Climate Resiliency Workgroup and assess priorities** | **a. Develop a workgroup charter that describes workgroup’s role, membership contributions, participation benefits, and operating principles – how best the workgroup can support climate resilience outcomes and other workgroup outcomes and within the watershed and member organizations.**  **b. SRS Support – Develop Climate Resiliency Workgroup work plan, logic table and update management strategies to determine the workgroup approach and actions for the next two years**  **c. Prepare document of high priority science needs to disseminate among groups**  **d. Work with the Management Board to identify opportunities with their organizations and other government agencies to support CBP climate-related activities outside the current CRWG capacity (see Climate-Related Activities Table).** | Lead: CRWG  Support: MB, STAR |  | 2021-2022 |
| 1.10  (17) | **Understand where there are gaps in the CRWG membership to support Monitoring and Assessment and Adaptation outcomes** | **a. Distribute survey to workgroup members to understand their climate related interests and expertise**  **b. Seek to expand workgroup membership to include more federal partners where there are likely to be more funding opportunities** | Lead: CRWG |  | 2021 |

Appendix: Climate-Related Activities across the Chesapeake Bay Program. Support from CRWG will be on a case-by-case basis and dependent on the availability of staff and workgroup members.

|  | Monitoring & Assessment Climate-Related Activities | | | | |
| --- | --- | --- | --- | --- | --- |
| Activity # | Description | Performance Target(s) | Responsible Party (or Parties) | Geographic Location | Expected Timeline |
| Management Approach 1: Assess past and future trends in sea level, precipitation patterns, temperature and ecosystem response to climate change | | | | | |
| 2.1 (3) | Explore efforts that support sentinel sites and technological strategies that could allow for long-term monitoring | a. Potential STAC proposal for establishing sustainable, cost effective monitoring and assessment recommendations to fully address Chesapeake Bay TMDL water quality standards assessment | Criteria Assessment Protocol Workgroup (Peter Tango) |  | Outside CRWG current capacity |
| Management Approach 2: Develop a research agenda to improve understanding of climate impacts and fill critical data and gaps related to monitoring and modeling | | | | | |
| 2.2  (4) | Increase capacity to better understand precipitation changes with regards to intensity, annual amounts, seasonal impacts, storm events related to storm water management | a. Provide support to the Urban Stormwater Workgroup where needed from an advisory capacity for the applying information from the Intensity, Duration, Frequency (IDF) curve GIT-funded project to address climate impacts due to precipitation changes to inform the TMDL. | Lead: Urban Stormwater Workgroup; Support: Modeling Workgroup, CRWG | All jurisdictions | 2021-2022 |
| 2.3  (6) | Increase capacity to better understand increased precipitation and warming temperature on SAV | a. SAV – Supporting climate SAV model synthesis GIT-funding project to better understand climate change impacts on SAV populations. | Technical Lead: SAV Workgoup; Support: CRWG |  | 2021-2023 |
| Management Approach 3: Undertake public, stakeholder and local engagement to increase understanding of climate change impacts | | | | | |
| 2.4  (7) | Promote the availability and accessibility of climate and other related science data and information | a. Explore potential collaboration with EnviroAtlas to use data in from the Chesapeake Bay Data and Mapping Portal in support of Chesapeake Bay Program needs. It is available at: at https://data-chesbay.opendata.arcgis.com/search?tags=Climate%  20Resiliency | Lead: CBP GIS Team, STAR Support: CRWG |  | Limited CRWG staff resources to support this action in 2 year timeframe |
| 2.5  (8) | Target engagement with educators, business leaders, state, municipalities, and local managers to enable incorporation of climate information/impacts into their decision-making | a. Work with existing Chesapeake Bay educational network to provide data, information, and topical experts in support of targeted engagement related to climate change impacts  b. Provide information for the educational modules being developed by the Local Leadership Workgroup (Julie Reichert-Nguyen & Breck Sullivan)  c. Provide support to the GIT Funded Project “Planning for Clean Water: Local Government Workshops.” (Break Sullivan) | Lead: Local Leadership Workgroup  Support: CRWG |  | Limited CRWG staff resources to support this action in 2 year timeframe |
| 2.6 | Support a “Chesapeake Bay Climate Adaptation Workshop” or adaptation related training | a. Define purpose and goals of workshop/training and explore potential funding avenues, partner sponsorship, or leveraging existing regional/local conferences, forums, or workshops. |  |  |  |
| 2.7  (9) | The CBP Local Engagement Team will support the Climate Outcome actions related to communications/outreach and/or engagement | a. Incorporate Climate Logic & Action Plan actions related to communications/outreach and/or engagement with local audiences in the Local Engagement Needs and Resources spreadsheet.  b. The Local Engagement Team will support the actions by assisting in implementation, facilitating communication, and connecting CRWG with groups that want to incorporate climate information/impacts into their decision-making | CBP Local Engagement Team |  |  |
|  |  | | | | |

|  | Adaptation Climate-Related Activities | | | | |
| --- | --- | --- | --- | --- | --- |
| Activity # | Description | Performance Target(s) | Responsible Party (or Parties) | Geographic Location | Expected Timeline |
| Management Approach 2: Implement and track priority adaptation actions, their effectiveness and ecological response and lessons learned | | | | | |
| 2.8(12) | Consider lessons learned from the implementation of state and local-level adaptation planning efforts | a. Review and discuss state level adaptation plans to determine commonalities, gaps, data needs and lessons learned | Modeling Workgroup, UMCES, VIMS, DCNR |  |  |
| Management Approach 3: Continually increase knowledge about the resiliency of the Chesapeake Bay watershed, such as the impacts of coastal erosion, inland and urban flooding, more intense and frequent storms and sea level rise | | | | | |
| (2.9)14 | Consult on Cross-GIT Climate Change Projects when staff resources are available | a. Healthy Watersheds – connect stream temperature indicator with healthy watershed index involving suitable brook trout habitat  b. Fish GIT – forage fish indicator related to warming temperatures on abundance  c. WQGIT – Review climate model narrative language and provide suggestions on the language for easier interpretation  d. Modeling – Application of climate TMDL model projections to inform adaptation decisions  e. Social science outcome review (GIT-funded project) | Relevant CBP GIT/workgroup climate-related activities, CRWG topical experts |  |  |