

**Chesapeake Bay TMDL 2017 Midpoint Assessment**  
**Policy Approach and Implementation Considerations for Addressing Climate Change in**  
**Jurisdictions' Phase III Watershed Implementation Plans**

CBP Climate Resiliency Workgroup  
WQGIT Briefing Document  
11.29.17

**Background:**

Informed by the outcomes of the Midpoint Assessment's climate change modeling assessment, the Chesapeake Bay Program (CBP) Partnership is scheduled to decide, in December 2017, how to incorporate climate change considerations into the jurisdictions'<sup>1</sup> Phase III Watershed Implementation Plans (WIPs). To inform this process, the CBP Climate Resiliency Workgroup (CRWG) was tasked with informing the climate change projections and scenarios for input into the watershed and estuarine modeling efforts; exploring the range of policy options for addressing climate change in the Phase III WIPs; and, developing policy implementation guidance for the Partnership's consideration. Reference materials for each of the activities, as well as the Partnership's overall climate change decision-making process, are contained in Appendix A.

Outlined below is additional information to guide the Partnership in the final stages of the decision-making process with regards incorporating climate change in Phase III WIPs.

**Decision-Process**

On December 13, 2016, the CBP Partnership Principals' Staff Committee (PSC) approved the [proposed climate change assessment procedures](#) for determining the projected mid-term (2025) and long-term (2050) impacts on the Chesapeake Bay watershed loads and the Chesapeake Bay water quality; and, the set of [Guiding Principles](#), as recommended by the Management Board. The PSC did not reach a decision on how to incorporate climate change considerations into the Phase III WIPs at its December 13, 2016 meeting, but instead, agreed to the following:

- 1) evaluate how a numerical or "quantitative" policy approach<sup>2</sup> would play out based on additional modeling results as they become available; and,
- 2) consider revised language for the proposed programmatic or "qualitative" policy approach.

Final decisions related to how to incorporate climate change considerations into the jurisdictions' Phase III Watershed Implementation Plans (WIPs) will be taken up again by the PSC on December 19-20, 2017. In the interim, however, the PSC approved revisions to programmatic policy approach language<sup>3</sup>, as recommended by the WQGIT, on October 30, 2017.

---

<sup>1</sup> Jurisdictions include the six Bay Watershed states (NY, PA, MD, DE, WV, VA) and the District of Columbia.

<sup>2</sup> *Numerical "Quantitative" Policy Approach - Factor Climate Change into Phase III WIPs Base Conditions:* Use the 2025 climate projection scenarios as base conditions (informed by CBWM climate modeling results) in the establishment of the jurisdictions' Phase III WIPs. The climate change projection would be an added load that the jurisdictions would need to address in addition to their Phase III WIP planning targets, thereby increasing the level of effort.

<sup>3</sup> *Programmatic "Qualitative" Policy Approach - Optimize Phase III WIP Development and Adaptively Manage BMPs:* Within a practical time-period applicable to an individual source sector, initiative or action, the Partnership will consider new information on the performance of BMPs, including the contribution of seasonal, inter-annual climate variability, and weather extremes. Jurisdictions will assess this information and their support programs and adjust plans through the two-year milestone process to implement their Phase III WIPs to better mitigate anticipated increases in nitrogen, phosphorus, or

**The Issue:**

How to incorporate climate change considerations into Phase III WIPs.

**Important Timelines and Process Steps to consider:**

On December 19-20, 2017, the PSC is scheduled to decide how to incorporate climate change considerations into the jurisdictions’ Phase III WIPs. Leading up to this, the WQGIT will review final modeling results and make recommendations on the policy approach at its November 4-5, 2017 joint meeting with the CBP Modeling Workgroup.

**Decisions:**

The key decision before the Partnership is whether to address climate change using a numerical (quantitative) and/or a programmatic (qualitative) approach in Phase III WIPs. The Partnership should not consider the two approaches as mutually exclusive: they could be implemented in tandem, or one in lieu of the other. Two WQGIT decision points, related to the policy approaches, are outlined below:

**Decision Point #1: Recommend a numerical and/or programmatic policy approach to guide Jurisdictions’ development and implementation of Phase III Watershed Implementation Plans**

***Numerical Approach*** – This is a “quantitative” approach that, depending on final model outputs, may result in a changed level of effort necessary to meet water quality standards. At its September 25-26, 2017 in-person meeting, the WQGIT recommended that consideration of this approach be informed by final Watershed and Water Quality Sediment Transport Model results. More specifically, the WQGIT recommended that the assessment of climate change on assimilative capacity (WQSTM modeling results) be a factor in establishing changes in loads. This approach would treat the estimated cumulative effect of changed conditions due to climate change similarly to the method approved by the WQGIT to account for growth: building the findings into the calculation of the Bay’s assimilative capacity. Phase III WIPs would be developed to account for changes in pollutant loads.

| Pros  | Cons   |
|---|--|
| <ul style="list-style-type: none"> <li>• Comprehensive, straight-forward approach</li> <li>• Demonstrates Partnership’s commitment to <i>Chesapeake Bay Agreement Climate Resiliency Goal</i>.</li> <li>• Potentially small level of increased effort necessary.</li> <li>• Near-term response.</li> <li>• Implemented in sequence with development of the Phase III WIPs.</li> </ul> | <ul style="list-style-type: none"> <li>• Potential change in the level of effort required to meet water quality standards.</li> <li>• If implemented in isolation, would not address the anticipated impacts of climate change on BMPs.</li> </ul> |

---

sediment due to climate change. Jurisdictions will provide a narrative consistent with the Guiding Principles that describes their programmatic commitments to address climate change in their Phase III WIPs.

***Programmatic Approach*** - An “adaptive management approach” that would be implemented through the two-year milestone process. If implemented as a stand-alone approach, this would not change jurisdictions' planning targets. This approach would direct the Partnership to collect and consider new information on the performance of BMPs, including the contribution of seasonal, inter-annual climate variability, and weather extremes. Jurisdictions would assess this information and adjust plans, over-time, to better mitigate anticipated changes in loads and impacts on the performance of BMPs. Would require the inclusion of a narrative strategy in Phase III WIPs, describing jurisdictions’ programmatic commitments to address climate change. The Partnership has approved “[Guiding Principles](#)” for incorporating climate considerations in both Phase III WIP development and implementation. A sample “*narrative strategy*” would be provided to jurisdictions to guide implementation.<sup>4</sup>

| Pros   | Cons  |
|--|---|
| <ul style="list-style-type: none"> <li>• Would allow for adaptively managing for long-term change.</li> <li>• Allows for use of local expertise and knowledge.</li> <li>• Provides for learning across jurisdictions about methods and results.</li> <li>• Allows for flexibility in jurisdictions’ approaches to addressing climate change.</li> <li>• Would set standard elements for Phase III WIPs.</li> </ul> | <ul style="list-style-type: none"> <li>• If implemented as a stand-alone approach, it would delay substantive action to address climate change in the near-term.</li> <li>• Lack of specific technical understanding to guide implementation.</li> <li>• Requires additional monitoring and assessment efforts.</li> <li>• Could lead to inconsistency in implementation across jurisdictions.</li> </ul> |

**Decision Point #2: Establish the level of flexibility among jurisdictions, as well as commitments for CBP programmatic support (e.g., guidance, data, funding, etc.), for implementation of climate change policies that exceed the standards, ultimately approved by the Partnership.**

*Implementation Considerations:* Upon a decision by the Partnership to adopt one approach in lieu of the other, it is foreseeable that an individual jurisdiction may request CBP programmatic support (e.g., additional modeling, implementation guidance, funding, etc.) for implementation in their Phase III WIPs.

---

<sup>4</sup> The CRWG has compiled informational material, including a “Sample Narrative Template,” outlining a potential method for implementation of this policy approach (See Appendix B). Once the Partnership reaches agreement on the approach to consider climate change in Jurisdictions’ Phase III WIPs, formal implementation guidance will be developed and approved by the CRWG and WQGIT.

## **Appendix A: Reference Material**

### ***Climate Change Projections and Scenarios***

Chesapeake Bay Program, 2016. Climate Resiliency Workgroup. [Recommendations on Incorporating Climate-Related Data Inputs and Assessments: Selection of Sea Level Rise Scenarios and Tidal Marsh Change Models to Inform the Chesapeake Bay TMDL 2017 Mid-Point Assessment](#) (August 5, 2016).

Johnson, Z., M. Bennett, L. Linker, S. Julius, R. Najjar, M. Mitchell, D. Montali, R. Dixon, 2016. [The Development of Climate Projections for Use in Chesapeake Bay Program Assessments](#). Chesapeake Bay Program Scientific and Technical Workgroup. Annapolis, MD.

NOAA Technical Report NOS CO-OPS 083. "Global and regional sea level rise scenarios for the United States. January 2017. Available at: [https://tidesandcurrents.noaa.gov/publications/techrpt83\\_Global\\_and\\_Regional\\_SLR\\_Scenarios\\_for\\_the\\_US\\_final.pdf](https://tidesandcurrents.noaa.gov/publications/techrpt83_Global_and_Regional_SLR_Scenarios_for_the_US_final.pdf)

US Council on Environmental Quality. 2016. Climate Resilience Toolkit, Climate Explorer. Available at: <https://toolkit.climate.gov/>

### ***Modeling Documentation and Decision-Support Materials***

- Chesapeake Bay Program, Modeling Team. 2016. Principals' Staff Committee [Briefing Document: Preliminary Phase 6 Watershed Model and Chesapeake Bay Water Quality Sediment Transport Model Climate Change Assessment Procedures and Scenarios for the 2017 Midpoint Assessment](#) (December 13, 2016).
- [Draft Phase 6 Watershed Model Documentation](#)
- [Draft 2017 Watershed Quality Sediment Transport Model Documentation](#)

### ***STAC Peer Review Documents***

- [Chesapeake Bay Program Partnership's Climate Change Assessment Framework and Programmatic Integration and Response Efforts: Request for STAC Peer Review](#)
- [STAC Peer Review Report \(in press\)](#)
- [Peer Review Documentation](#)
- [Peer Review Webinar](#)

### ***Policy Option Briefing Memorandums and Decision-Support Materials***

Chesapeake Bay Program, Climate Resiliency Workgroup. 2016. Water Quality Goal Implementation Team [Briefing Document: Guiding Principles and Options for Addressing Climate Change Considerations in the Jurisdictions' Phase III Watershed Implementation Plans](#) (October 11, 2016)

Chesapeake Bay Program, Climate Resiliency Workgroup. 2016. Principal Staff Committee [Briefing Document: Guiding Principles and Options for Addressing Climate Change Considerations in the Jurisdictions' Phase III Watershed Implementation Plans](#) (December 13, 2016)

Chesapeake Bay Program, Climate Resiliency Workgroup. 2017. Water Quality Goal Implementation Team [Briefing Document: Policy Options and Implementation Considerations for Addressing Climate change in Jurisdictions' Phase III Watershed Implementation Plans](#) (September 6, 2017).

Chesapeake Bay Program, Climate Resiliency Workgroup. 2017. [Fact Sheet. Resilient BMPs: Planning Tools and Resources](#) (November 2017).

Johnson, Z. et. al. [STAC Workshop Report: Monitoring and Assessing Impacts of Changes in Weather Patterns and Extreme Events on BMP Siting and Design.](#) (in press).

Chesapeake Bay Program, Climate Resiliency Workgroup. Fact Sheet: *Climate Resiliency Principles for Phase III WIPs* [http://www.chesapeake.org/stac/workshop.php?activity\\_id=280](http://www.chesapeake.org/stac/workshop.php?activity_id=280) (in press).

### ***CBP Partnership Decision-Support Presentations***

[Oct 24-25, 2016 WQGIT Presentation](#)

[November 16, 2016 CAC Presentation](#)

[December 1, 2016 LGAC Presentation](#)

[Dec. 13, 2016 PSC Presentation](#)

[December 19, 2016 CRWG Presentation](#)

[March 23, 2017 LGAC Presentation](#)

[May 8, 2017 Climate Change Webinar](#)

[June 19, 2017 CRWG Presentation](#)

[August 28, 2017 CRWG Presentation](#)

[September 19, 2017 Climate Change Webinar](#)

[September 26, 2017 WQGIT Presentation](#)

[October 16, 2017 CRWG Presentation](#)

[October 17, 2017 Modeling WG Presentation](#)

[October 30, 2017 PSC Presentation](#)

[November 13, 2017 WQGIT Presentation](#)

### ***Public Comments***

Choose Clean Water. Letter to Secretary Ben Grumbles, Chair, Principal Staff Committee, 28 November 2017. TS

Choose Clean Water. Letter to Secretary Molly Ward, Chair, Principal Staff Committee, 2 January 2017. TS

## Appendix B. Programmatic Policy Approach: Guidance Example

*(Under development by the Climate Resiliency Workgroup and Water Quality Goal Implementation Team)<sup>5</sup>*

### ***Programmatic “qualitative” Policy Approach: Optimize Phase III WIP Development and Adaptively Manage BMP Implementation***

*Description:* Within a practical time-period applicable to an individual source sector, initiative or action, the Partnership will consider new information on the performance of BMPs, including the contribution of seasonal, inter-annual climate variability, and weather extremes. Jurisdictions will assess this information and their support programs and adjust plans through the two-year milestone process to implement their Phase III WIPs to better mitigate anticipated increases in nitrogen, phosphorus, or sediment due to climate change. Jurisdictions will provide a narrative consistent with the Guiding Principles that describes their programmatic commitments to address climate change in their Phase III WIPs.

*Implementation Considerations:* The CBP’s assessment of the projected impacts and modeling results of climate change in 2025 and 2050 for a range of scenarios would be relayed to the jurisdictions. The jurisdictions would include a narrative strategy in their Phase III WIPs, outlining their programmatic and/or numeric commitments to address projected impacts consistent with the Guiding Principles, outlined below (approved by the PSC on December 13, 2016).<sup>6</sup> Narrative strategies could vary across jurisdictions; however, by following a “narrative template,” they could be standardized or harmonized to provide for transparency, accountability, and consistency. EPA could potentially use these elements as a guide to evaluate the proposed narrative strategies in the Phase III WIPs.

To inform implementation, over the longer-term, it is expected that the Partnership would need to work together to facilitate the collection and evaluation of BMP performance data. This will enable the Partnership to learn more about BMP performance and the sensitivity of BMPs that are attributable to climate change, to allow for consideration of these factors while adaptively managing for long-term change. Periodically, in support of this action, the CBP Partnership, through STAC working consultatively with CRWG, could compile and assess the latest climate and ecosystem science, research, or data, and relay this information to jurisdictions.

#### *Sample Narrative Template:*

##### I. Scientific Assessment and Conclusions

---

<sup>5</sup> Appendix B includes informational material compiled by the CRWG, including a “Sample Narrative Template.” This document outlines a potential means and method for implementation of the proposed programmatic policy approach. Once the Partnership reaches agreement on the approach to consider climate change in Jurisdictions’ Phase III WIPs, formal implementation guidance will be developed and approved by the CRWG and WQGIT.

<sup>6</sup> Jurisdictions should also reference Chesapeake Bay TMDL, Section 7: Reasonable Assurance and Accountability Framework; and, Section 10: Implementation and Adaptive Management for guidance on developing narrative strategies.

- a) The CBP’s assessment of the projected impacts and modeling results of climate change in 2025 and 2050 for a range of scenarios would be relayed to the jurisdictions. In response, jurisdictions should describe method(s) for gathering and assessing additional scientific data and information. This element allows for flexibility in jurisdictions’ approaches to addressing climate change, and can incorporate local knowledge and information where quantitative data may be lacking.
- b) Identify conclusions based on scientific assessments.
- c) Address how the scientific conclusions guided their programmatic and/or numeric commitments. Jurisdictions should use local expertise and knowledge along with the latest climate information and science to inform their programmatic and/or numeric commitments.

## II. Programmatic and/or Numeric Commitments

- a) Outline programmatic and/or numeric commitments to address projected impacts consistent with the Climate Resiliency Guiding Principles. Commitments may vary across jurisdictions but could include activities such as undertaking demonstration projects; prioritizing implementation of climate-resilient BMPs; approaches for assessing vulnerability of planned BMPs; or enhancing plans, policies, regulations or on-the-ground efforts to address impacts, etc. Jurisdictions could also pursue BMPs with clear co-benefits and climate change-related positive impacts (e.g., habitat restoration and flood control).

## III: Phase III WIP Development: Planning and Scoping<sup>7</sup>

- a) Describe the process used to guide Phase III WIP development, in accordance with the approved Climate Resiliency Guiding Principles for WIP Development:
  1. *Capitalize on “Co-Benefits”* – maximize BMP selection to increase climate or coastal resiliency, soil health, flood attenuation, habitat restoration, carbon sequestration, or socio-economic and quality of life benefits.
  2. *Account for and integrate planning and consideration of existing stressors* – consider existing stressors such as future increase in the amount of paved or impervious area, future population growth, and land-use change in establishing reduction targets or selection/prioritizing BMPs.
  3. *Align with existing climate resiliency plans and strategies* – align with implementation of existing greenhouse gas reduction strategies; coastal/climate adaptation strategies; hazard mitigation plans; floodplain management programs; fisheries/habitat restoration programs, etc.
  4. *Manage for risk and plan for uncertainty* – employ iterative risk management and develop robust and flexible implementation plans to achieve and maintain the established water quality standards in changing, often difficult-to-predict conditions.
  5. *Engage Local Agencies and Leaders* – work cooperatively with agencies, elected officials, and staff at the local level to provide the best available data on local impacts from climate change and facilitate the modification of existing WIPs to account for these impacts.

## IV. Phase III WIP Implementation: BMP Evaluation Process<sup>8</sup>

---

<sup>7</sup> See Johnson, Z. et. al. In-Press. [STAC Workshop Report: Monitoring and Assessing Impacts of Changes in Weather Patterns and Extreme Events on BMP Siting and Design](#). (in press) for more information and guidance on implementation.

<sup>8</sup> See Johnson, Z. et. al. In-Press. [STAC Workshop Report: Monitoring and Assessing Impacts of Changes in Weather Patterns and Extreme Events on BMP Siting and Design](#). (in press) for more information and guidance on implementation.

a) Describe the process used by jurisdictions to implement WIP programmatic and/or numeric commitments, including proposed the qualitative and/or quantitative evaluation of and implementation of BMPs, in accordance with the approved Climate Resiliency Guiding Principles: WIP Implementation.

1. *Reduce vulnerability* - use “Climate-Smart” principles to site and design BMP’s to reduce future impact of sea level rise, coastal storms, increased temperature, and extreme events on BMP performance over time. Vulnerability should be evaluated based on the factor of risk (i.e. consequence x probability) in combination with determined levels of risk tolerance, over the intended design-life of the proposed practice.

2. *Build in flexibility and adaptability* - allow for adjustments in BMP implementation in order to consider a wider range of potential uncertainties and a richer set of response options (load allocations, BMP selections, BMP redesign). Use existing WIP development, implementation and reporting procedures, as well as monitoring results and local feedback on performance, to guide this process.

#### V. Documentation, Reporting and Adaptive Management

- a) Establish a timeline for submission of documentation and reporting on all of the above. Reporting should include findings of new or updated scientific assessments and resulting changes to Phase III WIPs, including adjustments to two-year milestones. Documentation, reporting, and adaptive management shall be administered in accordance with Chesapeake Bay TMDL, Section 7: Reasonable Assurance and Accountability Framework<sup>9</sup>; and, Section 10: Implementation and Adaptive Management<sup>10</sup>.
- b) Jurisdictions would identify programmatic and/or numeric efforts and plans to adaptively manage. Jurisdictions should describe processes that will allow for changes in BMP selection or WIP implementation, over-time, as new climate and ecosystem science, research, or data becomes available and the understanding of the impact of how changing seasonal, inter-annual climatic, and weather conditions may affect the performance of watershed restoration practices.

---

<sup>9</sup> Chesapeake Bay TMDL, Section 7: Reasonable Assurance and Accountability Framework

<sup>10</sup> Chesapeake Bay TMDL, Section 10: Implementation and Adaptive Management