

2017 Midpoint Assessment: Climate Change Components

*Preliminary Modeling Results
&
WQGIT Recommendations and PSC Decisions*

Summary for CRWG

October 16, 2017

Climate Change & the TMDL Mid-Point Assessment

Assessment Procedures (approved)

Assess how climate change may affect current water quality standards (i.e., nutrient and sediment source loads over time and attainment)

- Precipitation change (increased volume and intensity)
- Temperature increase (air and water)
- Sea level rise (hydrodynamics and impacts to beneficial resources (i.e., wetlands))

Guiding Principles (approved)

- WIP Development
 - Capitalize on Co-Benefits
 - Reduce vulnerability
- WIP Implementation
 - Monitor performance
 - Adaptability

Policy Options (under consideration)

- Quantitative
 - Factor climate change impacts into Phase III WIP Base Conditions
- Qualitative
 - Optimize WIP Development and Adaptively Manage BMP Implementation

Climate Change

Recap of Policy Decisions

The Partnership will decide how to address climate change considerations in the Phase III WIPs:

Quantitatively – accounting for additional loads due to climate change impacts projected through 2025 in the Phase III WIPs

AND/OR

Qualitatively – adaptively manage climate change considerations through the implementation of BMPs (with climate resilient characteristics) and other commitments through the Phase III WIPs and 2-year milestones



Preliminary Modeling Results (2025): Watershed Model (Phase 6)

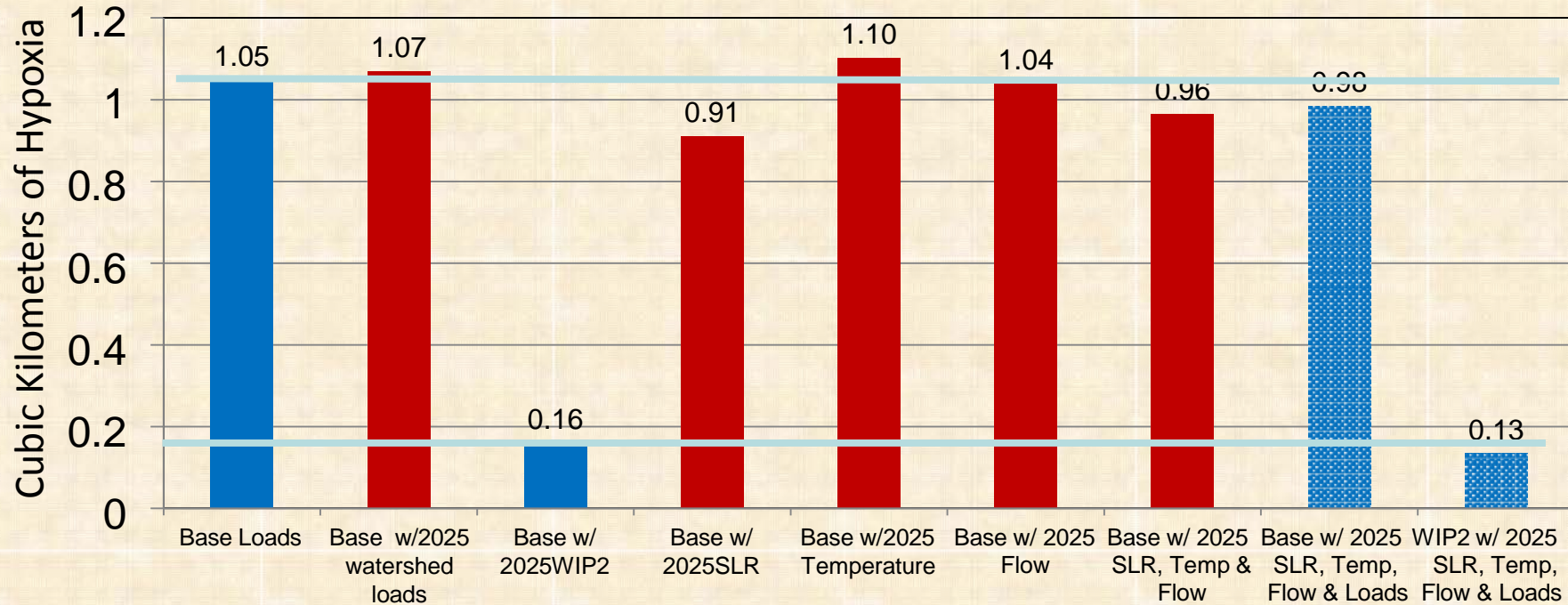
Pollutant of Concern	Change in Delivery to Rivers	Change in Delivery to Bay
Nitrogen	+1.72%	+.34%
Phosphorus	+1.08%	+.04%
Sediment	+9.07%	+4%



Chesapeake Bay Program
Science, Restoration, Partnership

Preliminary Modeling Results (2025) Water Quality Sediment Transport Model

Hypoxic volume (DO <1 mg/l) in CB4MH (Model estimate in summer 1991-2000)



DO <1 mg/l annual average daily hypoxia from 1991 to 2000 over the summer hypoxic season of May through September.

solid blue = key scenario, solid red = sensitivity scenario, stippled blue = 2025 climate scenario

This work used the Draft August Phase 6 Watershed Model and WQSTM to provide the best estimate of relative 2025 hypoxia under different temperature, sea level rise (SLR), and watershed flow and load conditions assuming a 0.3 m SLR condition. CBP Modeling Team to run the analysis on the final Watershed and WQSTM models and with a 0.17 m estimated SLR for 2025.

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Quantitative Policy Options

- *Factor Climate Change into Phase III WIP 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.

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Qualitative Policy Options

- *Optimize Phase III WIP Development and Adaptively Manage BMP Implementation:*
 - *Element A:* During the development of Phase III WIPs, jurisdictions will consider and prioritize BMPs that are more resilient to future climate impacts over the intended design life of the proposed practices.
 - *Element B:* 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.
 - *Element C:* Jurisdictions will provide a narrative consistent with the Guiding Principles that describes their programmatic commitments to address climate change in their Phase III WIPs.

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WQGIT Recommendations to the PSC

Decision Point #1: Approve policy approach to guide jurisdictions' development and implementation of their Phase III WIPs.

WQGIT Recommendation to PSC:

- Language changes on the policy options have been requested, including the removal of qualitative policy option Element A related to Phase III WIP development. The Climate Resiliency Workgroup will revise the language prior to the December 19-20, 2017 PSC meeting.

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WQGIT Recommendations to the PSC

Decision Point #2: Establish “minimum” standard for implementation in jurisdictions’ Phase III WIPs.

WQGIT Recommendation to the PSC:

- Did not reach consensus on adopting the quantitative policy component - 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 CBPO Modeling Team will provide 2025 climate change projections to give each jurisdiction an understanding of how their level of effort may change.
 - This information will be available by the time of the December 19-20, 2017 PSC meeting.

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WQGIT Recommendations to the PSC

Decision Point #2: Establish “minimum” standard for implementation in jurisdictions’ Phase III WIPs.

WQGIT Recommendation to the PSC:

- Did not reach consensus on adopting qualitative policy component Element B and Element C, as further discussions are needed.
 - Pros and cons of each quantitative and qualitative policy component will be developed and presented to the PSC at their December 19-20, 2017 meeting.
- If the level of effort to achieve the quantitative reductions are relatively low, consider adopting the quantitative approach in addition to any qualitative component.
 - Should the quantitative component be adopted, consider the possibility of post-2025 implementation to address any changes in levels of effort.

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WQGIT Recommendations to the PSC

Decision Point #3: Establish the level of flexibility among jurisdictions for implementation of climate change policies that exceed minimum standards.

WQGIT Recommendation to the PSC:

- Provide the jurisdictions with the flexibility to also address climate change quantitatively in the Phase III WIPs and 2-year milestones, if the Partnership adopts only the qualitative policy component.

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PSC Decisions & Process Timeline

- **Decision (10/3/17):** Removal of qualitative policy component Element A related to Phase III WIP development.
- **For the December 19-20, 2017 PSC Meeting:**
 - ***Decision Requested: (1) how should climate change considerations and impacts be factored into the Phase III WIPs and (2) by when?***
 - **Presentation** of modeling results of climate change impacts (precipitation change, temperature increase, and sea level rise) using final calibrated Phase 6 modeling tools, with a comparison of scenario results to the draft Phase III WIP planning targets to show any changes to levels of effort.
 - **Presentation** of the language changes to the policy components, as requested by the WQGIT.
 - **Presentation** of the pros and cons of adopting the quantitative and qualitative climate change policy components.

Decision-Support Materials



- [Briefing Document: *Policy Options and Implementation Considerations for Addressing Climate Change in Jurisdictions' Phase III Watershed Implementation Plans*](#)
- [Appendix A. *Guidance Example and Sample Narrative for Qualitative Policy Component*](#)
- [Compilation of climate change-related BMP implementation reference documents, tools, and resources.](#)
- [STAC Workshop Report \(under development\): *Monitoring and Assessing Impacts of Changes in Weather Patterns and Extreme Events on BMP Siting and Design* \(Sept. 7-8 2017\).](#)
- **Fact Sheet (under development): *Climate Resiliency Principles for Phase III WIPs***