

Factoring Climate Change into the Phase III WIP: Narrowing Down the Options

Chesapeake Bay Program

Principals' Staff Committee Meeting

December 13, 2016

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Climate Change Decision-Making Timeline

Three Key Sets of Partnership Decisions:

- **December 2016:** Agreement on 1) climate change assessment procedures, 2) guiding principles, and 3) a range of options for how and when to factor climate change considerations into the jurisdictions' Phase III WIPs
- **May 2017:** How and when to incorporate climate change considerations into the Phase III WIPs as the partners work on the draft Phase III WIP planning targets due in June 2017
- **December 2017:** Final Phase III WIP planning targets fully reflecting partnership decisions regarding how and when to incorporate climate change considerations

Principals' Staff Committee Decisions Requested Today

- Approval of Guiding Principles
- Approval of Climate Assessment Procedures as recommended by the WQGIT and Management Board
- Narrowing down the current range of 7 options for factoring climate change into the Phase III WIPs

Guiding Principles

WIP Development:

- Capitalize on “Co-Benefits”
- Account for and integrate planning and consideration of existing stressors
- Align with existing climate resiliency plans and strategies
- Manage for risk and plan for uncertainty
- Engage local agencies and leaders

WIP Implementation:

- Reduce vulnerability
- Build in flexibility and adaptability
- Adaptively manage

Principals' Staff Committee Decision Requested

Agreement to adopt the proposed guiding principles for
the jurisdictions' consideration during Phase III WIP
development

WQGIT and Management Recommended Climate Change Assessment Procedures

- Partition the influence of climate change into separate elements:

Estuary

- Increased estuarine temperatures
- Sea level rise
- Loss of tidal wetlands
- Water quality standards

Watershed

- Increased temperatures/ evapotranspiration
- Precipitation change
- Storm intensity
- Watershed flows and loads

- Run climate change scenarios based on estimated 2025 and 2050 conditions
- Run a range of scenarios to bound the range of uncertainty

Principals' Staff Committee Decision Requested

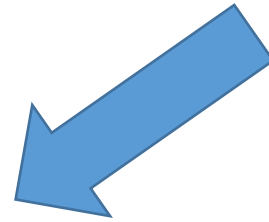
Agreement on the WQGIT and Management Board's
recommendations to adopt and apply the proposed
climate change assessment procedures

Early Climate Change Assessment Findings

Partition Climate
Change Effects

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Partition Climate
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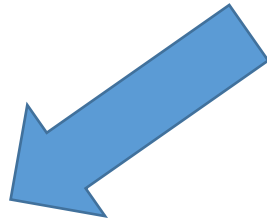


Estuary

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Early Climate Change Assessment Findings

Partition Climate Change Effects



Estuary

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Early Findings:

- Little change in tidal wetlands until beyond 2050
- Water temperature increase effect on low dissolved oxygen offset by higher sea level, more mixing
- No strong evidence that climate change impacts the Bay's assimilative capacity

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Early Climate Change Assessment Findings

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graph TD; A[Partition Climate Change Effects] --> B[Estuary]; A --> C[Watershed];
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Early Findings:

- Increased in precipitation (+) and increased temperature (-) leads to an estimated 3% increase in river flows
- Currently estimating up to a 2% increase in nutrient loads and 5% increase in sediment loads by 2025

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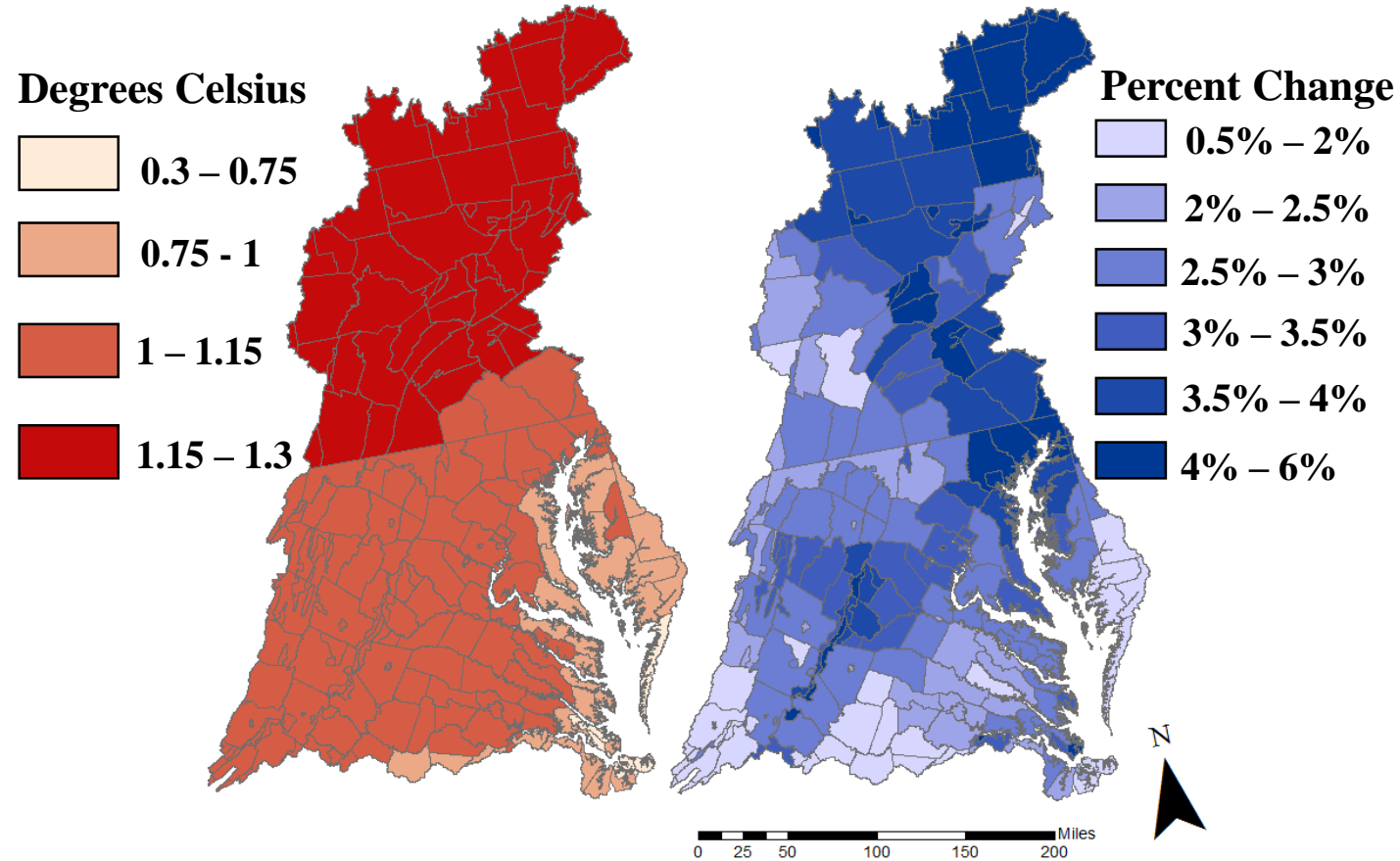
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Focus on watershed loads

Estimated Changes in Temperature and Precipitation by 2025



Temperature

Precipitation

Early Findings  **Policy Implications**

Early Findings Policy Implications

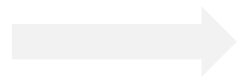
Minimal influence on Bay
assimilative capacity by 2025



May be no need to change Bay
assimilative capacity

Early Findings Policy Implications

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No need to change Bay
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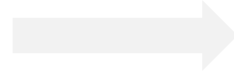
Watershed loads likely to
increase



Can quantify impact on watershed

Early Findings Policy Implications

Minimal influence on Bay
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No need to change Bay
assimilative capacity

Watershed loads likely to
increase



Can quantify impact on watershed

Effects of climate change varies
geographically across watershed



Implications not equal across
jurisdictions

Three Categories of Options

Quantitative

Qualitative

Deferred implementation

Quantitative Options

Option 1: Assimilative capacity

Option 2: Base conditions

Option 4: Margin of safety

Qualitative Options

Option 5: BMP optimization (WIP development)

Option 6: Adaptively manage (2-year milestones)

Option 7: Programmatic with set expectations

Deferred Implementation Option

Option 3: Commit with deferred implementation

Quantitative Options - Factoring in Findings

Option 1: Assimilative capacity

Option 2: Base conditions

Option 4: Margin of safety

Quantitative Options - Factoring in Findings

~~Option 1: Assimilative capacity~~

Option 2: Base conditions

Option 4: Margin of safety

Quantitative Options - Factoring in Findings

~~Option 1: Assimilative capacity~~

Option 2: Base conditions

~~Option 4: Margin of safety~~

Qualitative Options - Factoring in Findings

Option 5: BMP optimization (WIP development)

Option 6: Adaptively manage (2-year milestones)

Option 7: Programmatic with set expectations

Qualitative Options - Factoring in Findings

Option 5: BMP optimization (WIP development)

Option 6: Adaptively manage (2-year milestones)

Option 7: Programmatic with set expectations

Deferred Implementation Option Factoring in Findings

Option 3: Commit with deferred implementation

Principals' Staff Committee Decision Requested

Narrow down the current range of 7 options for accounting for climate change in the Phase III WIPS