Modeling Workgroup Priorities for 2018

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CBPO

2/6/2018

Watershed Model History

Phase	Year	Segments	Years	land uses	Purpose
0	1983	30	2	5	Split NPS/PS
1	1990	63	4	7	Refine NPS
2	1994	63	4	9	1992 "40%" agreement
4.1	1997	89	8	9	Confirmation of 40% goals
4.3	2003	94	8	9	Re-allocation in 2003
5.3	2010	1956	22	24	TMDL
5.3.2	2011	2365	22	30	Phase 2 WIP development

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6	2017	2365	30	50	Phase 3 Targets and WIPs

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…Now what?

WIP Planning Target Support Feb - May

- WQSTM model runs for assimilative capacity
- Problem segments
- Determine appropriate metric in open water for geo runs
- Run Geo Runs for 92 segments

Phase 6 documentation Feb - April

- Watershed model review response
- Estuarine model review response
- Watershed model documentation
- Application of models to decisions
  - Climate Change
  - Conowingo
  - Growth
- Peer-reviewed publications (2018)

Phase 6 Support
Feb - June

- Migrate to Cloud
- Final cleanup
- Share with community
- Systematic connection to estuarine models

Climate Change
2018 - 2019

- Watershed climate inputs
- Watershed sensitivities
- Estuarine inputs
- Comparisons with other efforts

- CHAMP project
- STAC workshop Proposal
- Session at the Chesapeake Research & Modeling Symposium 2018

Uncertainty Analysis
Late 2018 - ?

- Complete STAC workshop report
- Determine management purpose of uncertainty analysis
- Develop and apply methods

Optimization

- …

Development
2018 - 2023

Phase 5 Development Schedule

- 1998 – Conceptualization begins
- 1999 – Coding begins
- 2003 – Phase 4.3 applied
- 2006 – CBP Partnership requests Phase 5
- 2010 – Phase 5 delivered

Phase 6 Development Schedule

- 2009 – Conceptualization begins
- 2010 – TMDL on Phase 5
- 2011 – Phase II WIPs on Phase 5
- 2011 – Coding begins
- 2012 – CBP asks for Phase 6
- 2013 – CBP asks for Phase 6 input changes
- 2017 – Phase 6 delivered

Next Model Development Schedule

- 2016 – Conceptualization begins
- 2018 – **CBP Modeling in 2025 and Beyond Workshop**
- ???? – Coding begins
- ???? – CBP asks for next model
- 2025? – Next model delivered

Chesapeake Bay Program Modeling in 2025 and Beyond

- 60 scientists and managers
- Develop high-level recommendations for CBP models

- Day 1
  - Management needs
  - Previous advice
  - Existing CBP models
  - Cross-cutting topics
    - Models should be: Nimble, participatory, and able to link to models of other CBP outcomes

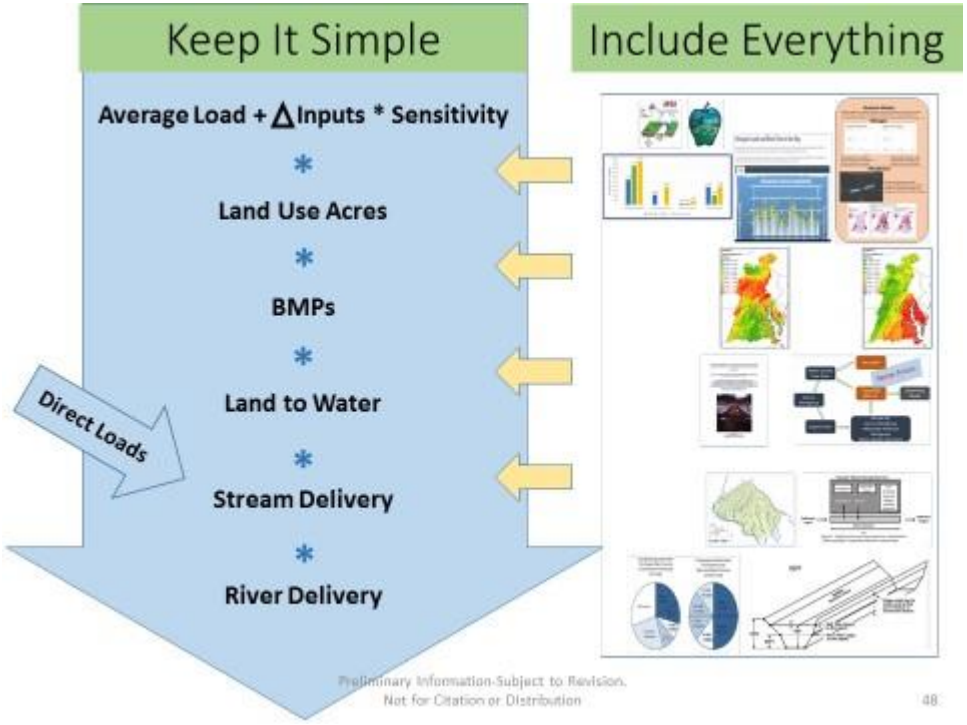
Chesapeake Bay Program Modeling in 2025 and Beyond

- Day 2: 8 Breakout groups – tasked with arriving at 4 recommendations each
- Watershed
  - Hydrology
  - Sediment
  - Nitrogen
  - Phosphorus
- Land use change
- Estuarine
  - Hydrodynamics
  - Biogeochemistry
  - Living Resources
- Day 3: discuss recommendations
- 32 recommendations!

Phase 7 – Evolution
Phase 8 - Revolution

- Phase 6 was a big jump, let's spend some time with that structure (managers agreed!)
- Hydrology, Sediment, Phosphorus, and Ecosystems need a revolution, but the models don't exist
- Nitrogen, Biogeochemistry, Land use continue to evolve
- Exception: hydrodynamics ready for a revolution now

Primary and Experimental models



- Estuarine examples:
  - Shallow water models
  - ChesROMs applications
- Expand to dynamic watershed models
- Create estuarine model that could accept and test new modules

Local

- Watershed
  - Improve land use
  - Improve stream characteristics
  - Explore critical areas
  - Focus on BMPs
  - Local Benefits
  - Watershed Ecosystems
- Estuarine
  - Fine scale embedded in coarse scale model

More Workgroups

- Watershed Sediment
  - Make short term enhancements
  - Create new model from ground up
- Biogeochemistry
  - Critical mass of researchers
  - Work with a modular model
- Ecosystem
  - Freshwater and Estuarine
  - Links to CBP outcomes

…and of course