Update on STAC Reviews of Watershed and WQSTM Model Development for the Midpoint Assessment

Rachel Dixon and Bill Ball (CRC)

CBP Modeling Workgroup
June 15, 2017

At a glance, over last 2 years

- On behalf of CBP/STAC, the CRC has initiated…

FY15	FY16	FY17
• 7 workshops	• 4 workshops	• 6 workshops
• 2 reviews	• 6 reviews	• 1 review (so far)

- 4 reviews currently in progress
- 1 new (and final!) MPA review request received
- 2 non-MPA reviews/reports:

Review Title/Topic	Status	Sponsor
Technical Review of Microbeads/Microplastics in the Chesapeake Bay	**Complete**	CBC
Evaluating boat wake wave impacts on shoreline erosion and potential policy solutions	**Complete**	CBC

Review Title/Topic	Status	Sponsor
Chesapeake Bay Scenario Builder/Nutrient Input Approach	**Complete**	WQGIT Watershed Technical Workgroup
General Additive Models (GAMs) to estuarine WQ trend analysis and explanations	**Complete**	STAR Integrated Trends Analysis
2015 Chesapeake Bay Criteria Addendum	Finalizing	STAR Criteria Assessment Protocol Workgroup
Proposed revised James River chlorophyll *a* water quality criteria (Part I) (Part II)	**Complete** Finalizing	STAR Criteria Assessment Protocol Workgroup
Phase 6 Chesapeake Bay Watershed Model	Finalizing (most) (Conowingo and climate change just starting)	STAR Modeling Workgroup
Chesapeake Bay Water Quality/Sediment Transport Model (WQSTM)	In progress (awaiting CBP sensitivity testing & calibration)	STAR Modeling Workgroup
~~Application of WRTDS to watershed WQ trend analysis and explanations~~	***FY17 Workshop Proposal***	~~STAR Integrated Trends Analysis~~
Approach being taken to factor climate change considerations into the 2017 Chesapeake Bay TMDL Midpoint Assessment	Request received	STAR Climate Resiliency Workgroup
~~Phase 6 Land Use Hind Cast Methodology~~	***Request withdrawn***	~~WQGIT Land Use Workgroup~~

CBP/Management Board (MB) Responses have been received for 2 of the 3 completed reviews

Phase 6 Chesapeake Bay Watershed Model

- **Review Charge:** Phase 6 is the most recent of a series of increasingly refined versions of the CBWM, and is a major departure from previous deterministic and mechanistic versions. the water quality simulation is an entirely new approach which relies on a structure based on multiple models. The panel is reviewing the Phase 6 Model with particular emphasis on the new multiple model aspects of the watershed simulation

- **Panel's report (minus Conowingo and climate change) was provided to the CBP Modeling Workgroup on 12/2/16**

Reviewer	Affiliation
Zach Easton	VT, STAC
Don Scavia	U of Michigan
Doug Smith	USDA-ARS
Andrew Miller	UMBC, STAC
Peter Kleinman	USDA-ARS
Claire Welty	UMBC
Lawrence Band	UNC
Kathy Boomer	TNC, STAC
Rich Alexander	USGS
James Pizzuto	U of Del

Phase 6 Chesapeake Bay Watershed Model

- **Timeline:**
  -- Request received from CBP September 15, 2016
  -- Convened panel for in-person meeting September 28, 2016.
  -- Initial report (all questions except Conowingo & climate change) Dec. 2, 2016
  -- Received part II (Conowingo and climate) June 1, 2017. Review panel will re-convene and complete review over the next month single final report will be distributed to the Partnership.
- **Status:** As of June 1 (with release of the draft Phase 6 model), received new documentation addressing simulation of Lower Susquehanna reservoirs (i.e. Conowingo) and an assessment of influence of climate change on water quality standards.
  - Two new reviewers brought on for Conowingo:
    James L. Martin (Mississippi State U.)
    Gregory Morris (GLM Engineering COOP) [tentative]
- **Next Steps:** When the final two questions are completed, a single final document will be prepared, sent to STAC for review, and formally distributed to the Partnership.
  - Final recommendations outlined may be subject to change when the remaining questions are considered

Chesapeake Bay Water Quality/Sediment Transport Model (WQSTM)

- **Review Charge:** The 2017 version of the WQSTM is the most recent of a series of coupled hydrodynamic and water quality models. New aspects include improved 1) representation of the bioavailability of particulate organics and 2) ability to simulate Conowingo infill and climate change in tidal waters. Refinements to the shallow water simulation include 1) attenuation of nutrient/sediment loads through tidal wetlands, the 2) representation of shoreline loads, and the explicit representation of oyster aquaculture, sanctuaries, and wild populations.

Reviewer	Affiliation
Damian Brady	U of Maine
Joe DePinto	Limnotech (retired)
Marjy Friedrichs	VIMS, STAC
Tom Jordan	SERC
Dominic DiToro	U of Delaware
Steven Chapra	Tufts
Meng Xia	UMES
Matt Gray	UMCES Horn Point

Chesapeake Bay Water Quality/Sediment Transport Model (WQSTM)

- **Timeline:**
  -- WQSTM Request received from CBP November 28, 2016
  -- Attempted to convene panel late February 2017 (delayed w/ MPA timeline)
  -- Convened panel for in-person meeting June 5-6, 2017
  -- Review in progress, deadline for review panel's findings mid-July 2017.

- **Status:** Panel is working with Modeling Workgroup to gather additional sensitivity simulations and scenario runs after final calibration. Will then reconvene with webinar and conference calls.

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Challenges

- Changing timeline for Mid-Point Assessment (MPA)
  - Shift in MPA schedule/Phase 6 Model Approval Process
  - Scope and timeframe of reviews evolves over time.
    - Additional honoraria required – for greater review of scope, and/or panel retention over extended timelines
  - Time constraints and “responsive” review format limits scope and limits reviewers ability to comment on big-picture issues.
  - Difficult to schedule calls/meetings with larger panels

- Managing conflicts of interest is often a challenge (no panel members with related GIT or workgroup activity)

Opportunities

- MPA reviews have helped STAC get more ‘plugged in’ to the decision framework ongoing at the CBP – especially at the WQGIT
- Findings could lead to additional proactive review or workshop activities
- STAC Model Visioning Workshop – January 2018

We're almost there!!

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For more information regarding workshops and reviews (including reports, as available), visit the STAC webpage at:
http://www.chesapeake.org/stac/