Lower Susquehanna River Watershed Assessment

Request for STAC Technical Review

Photo: Jane Thomas (UMCES-IAN)

Maryland Department of Natural Resources

MDE

40th Anniversary SRBC 1971 - 2011

US Army Corps of Engineers

The Nature Conservancy

USGS science for a changing world

Chesapeake Bay Program

Development of a Science-Based Sustainable Watershed Management Program

Background and Reference Materials included herein:

Current LSRWA Targets

I. **Sedimentation Process Assessment**
   Describe physical process of sedimentation within the reservoir, historical and probable future sedimentation rates, location and grain size of sediment deposition.

II. Identify Sedimentation Impacts and Evaluate Timeframes

III. Screen Sediment Management Alternatives

IV. Technical and Economic Feasibility Studies

V. Design, Implementation, and Monitoring of Control Measures

Morris, G.L. and J. Fan, 1997. Reservoir Sedimentation Handbook.

Lower Susquehanna River Watershed Assessment
Goals & Objectives

1. **Evaluate strategies to manage sediment and associated nutrient delivery to the Chesapeake Bay**.
   - Strategies will incorporate input from Maryland, New York, and Pennsylvania Total Maximum Daily Load Watershed Implementation Plans
   - Strategies will incorporate evaluations of sediment storage capacity at the four hydroelectric dams on the Lower Susquehanna River.
   - Strategies will evaluate types of sediment delivery and associated impacts to Chesapeake Bay

2. **Evaluate strategies to manage sediment and associated nutrients <u>available for transport during high flow storm events</u>; to reduce impacts to the Chesapeake Bay**.

3. **Determine the effects to the Chesapeake Bay from the loss of sediment and nutrient storage from behind the hydroelectric dams on the Lower Susquehanna River.**

Scenario Assessment

1. **BASELINE**: Current LULC Mng't (2010), Current (2011) Bathymetry
2. **SHORT-TERM DREDGING**: Current LULC Mng't (2010), Removing 3M cy sediment
3. **LONG-TERM DREDGING**: Current LULC Mng't (2010), 1996 Bathymetry (Removing 25M cy sediment)
4. **WIP IMPLEMENTATION**, Current (2011) Bathymetry
5. **WIP IMPLEMENTATION, LONG-TERM DREDGING**

SCOUR EVENT IMPACT ASSESSMENT, by season

Under current and full WIP mng't conditons.

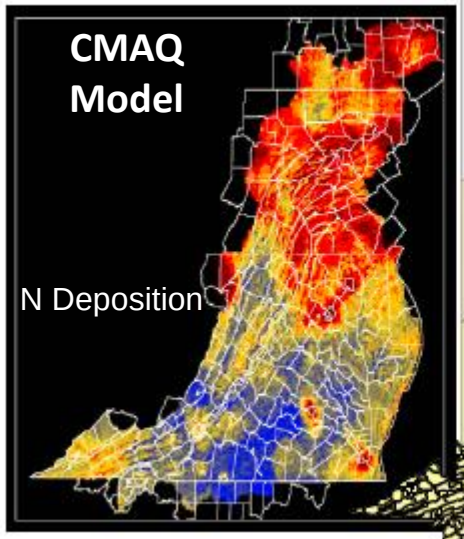
Preliminary Assessment of Reservoir Sediment Management Options

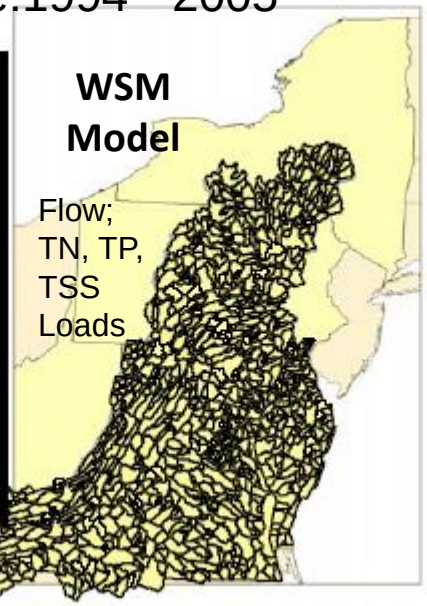
-Dredging, By-passing, Agitation, and Sluicing

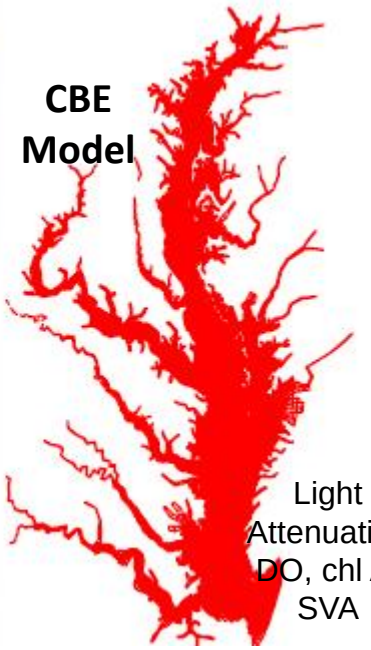
LSRWA Model Frameworks

1. CBP TMDL Model

ModelTimeframe:1994 - 2005

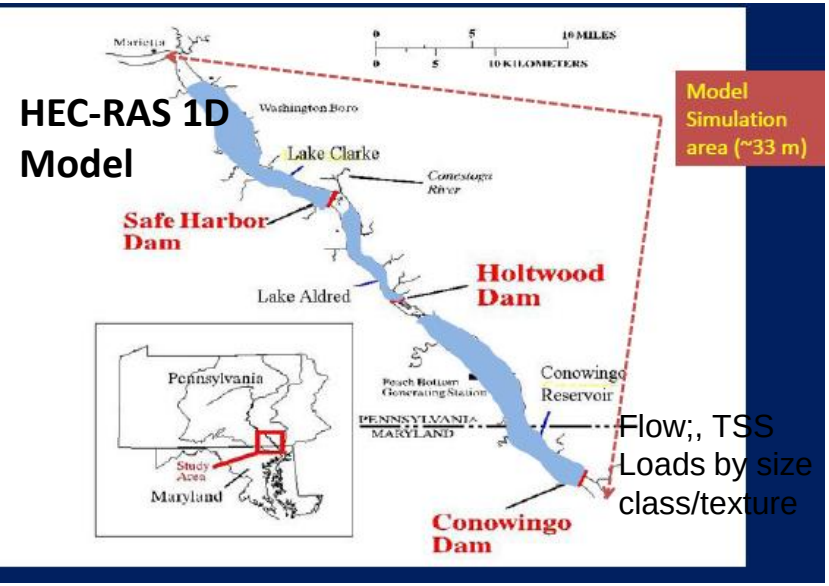


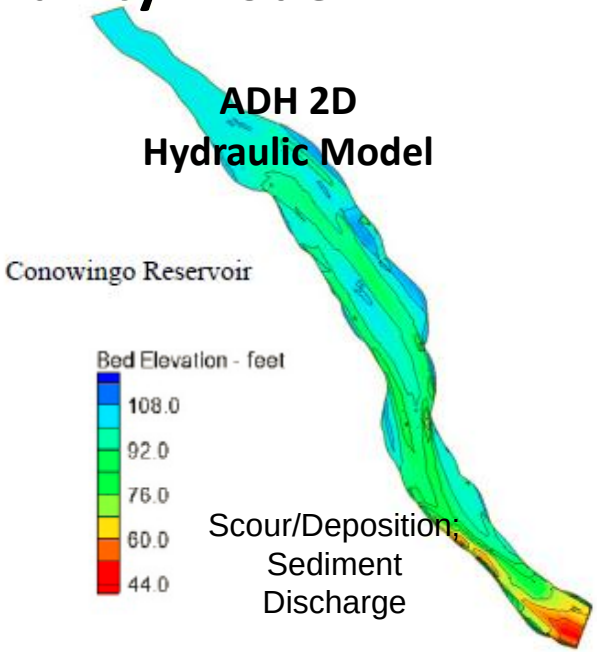


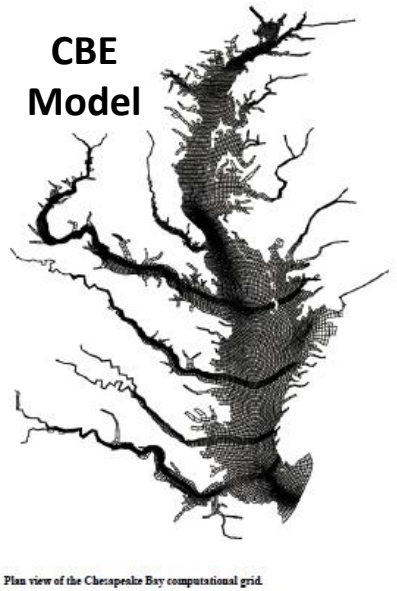


2. River-Reservoir-Estuary Community Model

ModelTimeframe: 2008 - 2011







Report Outline

Main Report (Non-technical):

Existing Conditions, Current Management, Proposed Sediment Management Scenarios, Stakeholder Involvement, Conclusions and Recommendations (~200 pages, plus citations)

Technical Appendices (A-H):

- Model reports (4)
- Input data and literature review reports (4)

Legal Documentation Appendices(2)

LSRWA Report Appendices: Modeling Reports

- Appendix A: Sediment Reservoir Transport Simulation of Three Reservoirs in the Lower Susquehanna River Basin, Pennsylvania using HEC-RAS" - Langland/USGS report (31 pp, plus sub-appendices)
- Appendix B: Sediment Transport Characteristics of Conowingo Reservoir –Scott/ERDC report (57 pp, plus sub-appendices)
- Appendix C: Application of the CBEM Package to Examine the Impacts of Sediment Scour in Conowingo Reservoir on Water Quality in the Chesapeake Bay."- Cerco/ERDC report (124 pp)

  Available upon request: Individual results for all CBEM scenarios.

- Appendix D : Estimated Influence of Conowingo Infill on the Chesapeake Total Maximum Daily Load –Linker/EPA report (28 pp.)

LSRWA Report Appendices: Supporting Documents

- Appendix E - MGS Susquehanna Flats (2012) Sampling Results
- Appendix F - USGS Conowingo Outflow Suspended Sediment Data Report (2011 sampling).
- Appendix G - Exelon Conowingo Bathymetry Surveys (2011).
- Appendix H - Literature Search Findings Report.
- Appendix I - Stakeholder Involvement: (Press releases, letters, quarterly meeting summaries, etc).
- Appendix J – Overview of LSRWA Plan Formulation
  - Descriptions of sediment management strategies evaluation and costs.
  - Summary Table of Major (14) Modeling Scenarios and Results.

Why Request a STAC Review?

- Fresh eyes to help identify gaps, opportunities… all especially important given potential legal proceedings.

- Opportunity to share state of the science

Proposed Directives

- Does the main report clearly define the goals, strategies, and the results/conclusions of the study, and also present adequate background material at a level suitable for understanding by non-technical audiences?

- Are the alternative sediment management approaches clearly described and documented ? Does this background material provide supporting evidence for the finding and conclusions of the study with regard to alternative sediment management approaches?

- Does the main report provide clear, supporting evidence for the results, findings, and conclusions of the study?

Proposed Directives

- Does the report adequately identify key uncertainties in the model applications which, with better information, could change the predicted outcomes of the alternative management scenarios evaluated in this study?

- Are the recommended follow up evaluations and analyses (Section 7) complete and comprehensive as well as clearly stated to enable the next phase of work to continue under the Partnership's Midpoint Assessment?

- Do the technical appendices provide the necessary documentation for the models and their applications in support of the study's the results, findings, and conclusions?

Current Proposed Timeline:

Version	Review	Target Review Timeframe	Reviewers
1	USACE District Quality Control Backcheck	14 Apr – 25 Apr	NAB (Angie Sowers, Andrew Roach, Chris Nolta, Bierly, Gross)
1	(A.) USACE Agency Technical Review, (B.) USACE Office of Counsel.	14 Apr – 25 Apr	(A.) Sue Ferguson, Nashville, Plan Formulation, Kim Franklin - Nashville, Biologist, Jim Kosky – Pittsburgh, H&H, Mike Alexander – Kansas City District-H&H/Operations/Dredging (B.) Jim Bemis
(1)	Technical Edit	5 May – 23 May	
	Conowingo Senate Hearing	5 May	
2	LSRWA Team	26 May – 6 Jun	LSRWA Team
3	**STAC**	**15 Jun – 15 Aug**	
3	LSRWA Quarterly Workgroup	23 Jun – 18 Jul	LSRWA Quarterly Workgroup
4	USACE Planning Chief	18 Aug – 22 Aug	Amy Guise
5	USACE Division	3 Sep – 2 Oct	North Atlantic Division Staff
6	Public Review	23 Oct – 21 Nov	General public, agencies, widest distribution as possible (**STAC comments may or may not be incorporated at prior to public review**).
7	USACE HQ	22 Dec – 20 Jan 2014	USACE HQ staff
8	Assistant Secretary of the Army office	6 Feb – 9 Mar 2014	Assistant Secretary of the Army office staff