

CBP Draft Phase 6 Watershed Model

Gary Shenk – USGS - Chesapeake Bay Program

Presentation to MWG

6/15/16

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Draft Phase 6 Released 6/1



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Modeling Workgroup - Ches x +

www.chesapeakebay.net/groups/group/modeling_team 80% Search

Members Meetings Workgroups & Task Groups Projects & Resources Publications

Draft Phase 6

This project page is the repository for the Phase 6 model, its documentation, as well as files and links to Tableau pages. Please email Kyle Hinson (khinson@chesapeakebay.net) with any questions you may have.

Documentation

All documentation files will be uploaded to this FTP site to assist in partnership review of Phase 6:
ftp://ftp.chesapeakebay.net/modeling/Phase6/Draft_Phase_6/Documentation/

Calibration

A summary PDF of calibration results has been generated and is available for download (large file): ftp://ftp.chesapeakebay.net/modeling/Phase6/Draft_Phase_6/Watershed_Model/WSM_Outputs/Calibration_Figures/00_Calibration_Figures_All_Phase6Draft.pdf

Other detailed calibration results for each calibrated parameter and river segment can be found in a separate FTP folder: ftp://ftp.chesapeakebay.net/modeling/Phase6/Draft_Phase_6/Watershed_Model/WSM_Outputs/Calibration_Figures/

Further detailed calibrated output for the watershed can be found in csv files located at this FTP site: ftp://ftp.chesapeakebay.net/modeling/Phase6/Draft_Phase_6/Watershed_Model/WSM_Outputs/Summary_Loads/

Further comparisons between the Watershed Model and WRTDS can be found at the non-tidal dashboard. These visual representations show both the loads estimated from monitoring data (WRTDS) and loads estimated from the Draft Phase 6 Model: <http://cast-beta.chesapeakebay.net/documentation/NonTidalWaterQualityDashboard>

Land Use Data

Land use files can be found at this FTP site: ftp://ftp.chesapeakebay.net/Modeling/Phase6/Draft_Phase_6/Land_Use/

Watershed Model Inputs

Links to the sites for Watershed Model Inputs can be found at these web pages:

CAST Homepage (Note: The Phase 6 CAST Beta will be directed here until June 15): <http://cast-beta.chesapeakebay.net/>

Phase 6 Soil Phosphorus Figures: <ftp://ftp.chesapeakebay.net/Modeling/soil-p-history/fig/>

Model Review Process

The process by which the partnership can most effectively submit comments and provide feedback to the development of the Phase 6 model will be outlined in a continuously updated document found below. The schedule of upcoming webinars is also provided below. Please contact Lewis Linker (llinker@chesapeakebay.net) or Kyle Hinson (khinson@chesapeakebay.net) with any questions.

Phase 6 Sediment Simulation Webinar: April 19, 2017, 1 PM - 3 PM ([webpage link](#), [recording link](#))

Phase 6 Integrated Models and Decision Framework Overview Webinar: May 9, 2017, 1 PM - 3 PM ([webpage link](#), [recording link](#))

Phase 6 CBP Model Poultry Data Webinar: May 24, 2017, 1 PM - 3 PM ([webpage link](#), [recording link](#))

Phase 6 Inputs Webinar: May 25, 2017, 1 PM - 3 PM ([webpage link](#), [recording link](#))

Phase 6 Loads Webinar: June 1, 2017, 1 PM - 3 PM ([webpage link](#), [recording link](#))

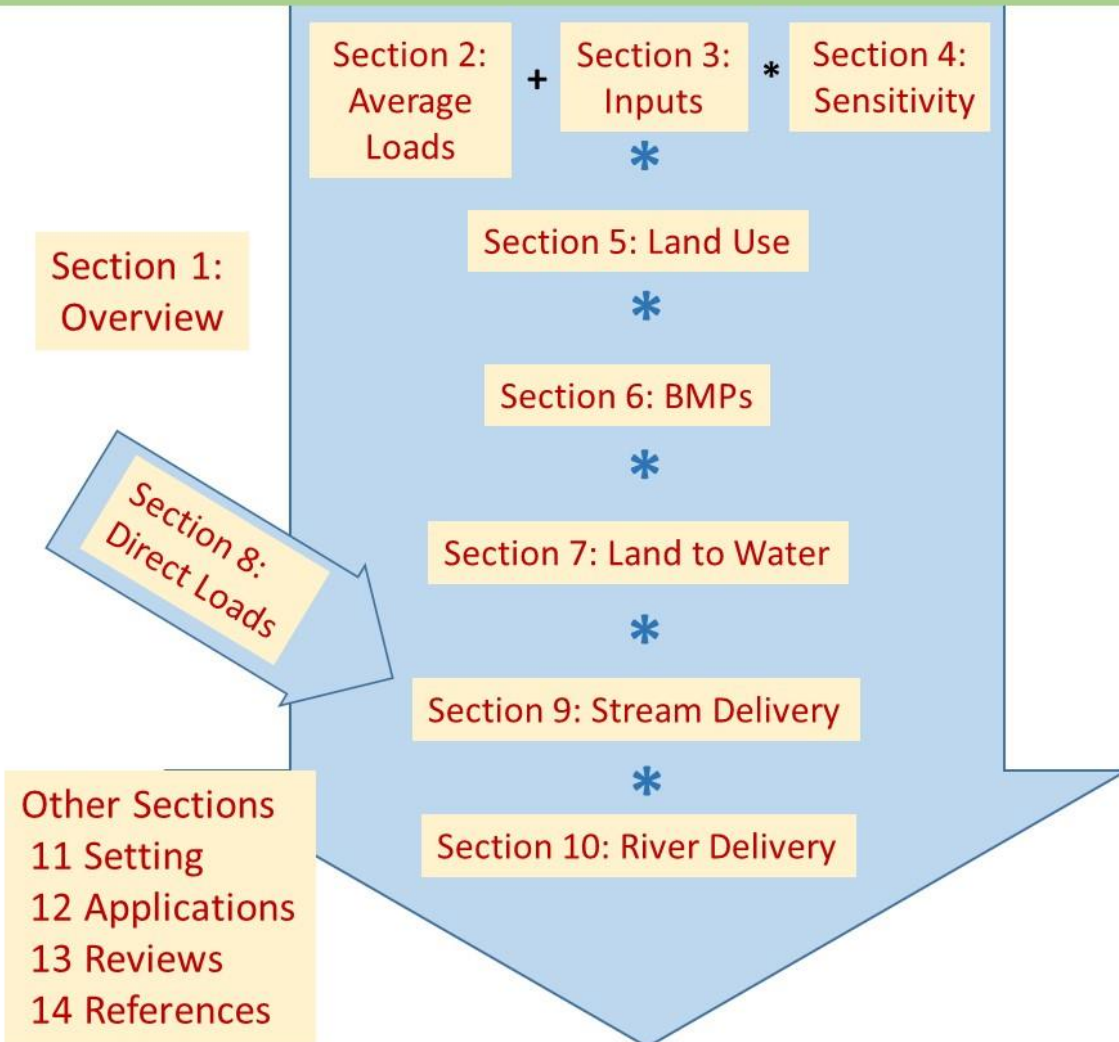
Phase 6 Physical Transport Webinar: June 20, 2017, 1 PM - 3 PM ([link](#))

Phase 6 Approval Process (622.55 KB)

Draft Phase 6 Watershed Model - Summary Statistics (3.35 MB)

Documentation

Phase 6 Model Documentation



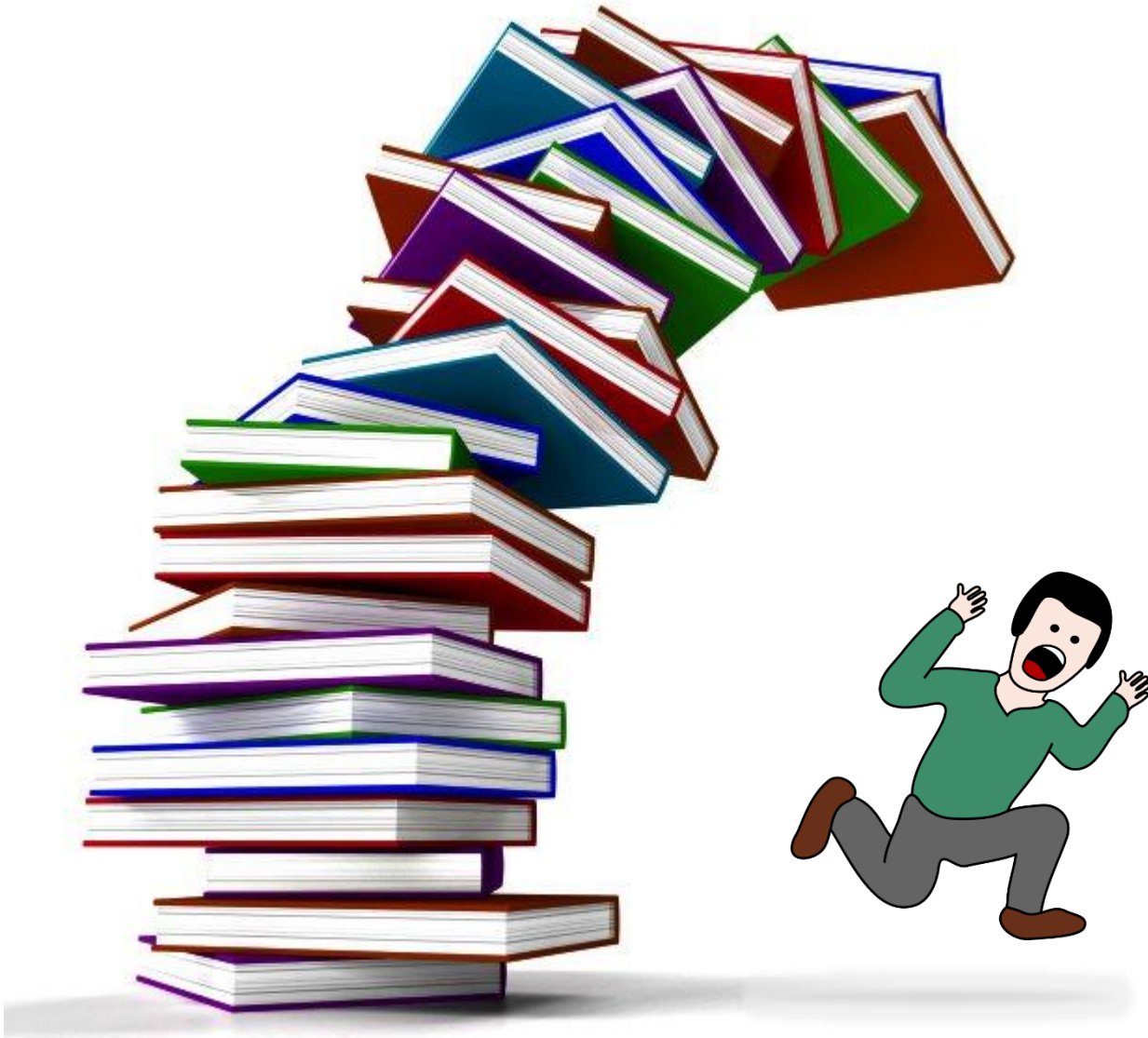
Documentation

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https://archive.chesapeakebay.net/modeling/Phase6/Draft_Phase_6_Documentation/

504 pages of documentation
405 pages of appendices

Review Strategy



Review Strategy

- Read Chapter 1
- Target Chapters and Sections that are important to you
- Main Prediction of CAST for decision support:
Change in Anthropogenic Load
 - BMPs
 - WWTP
 - Land use Change
 - Response to Change in inputs

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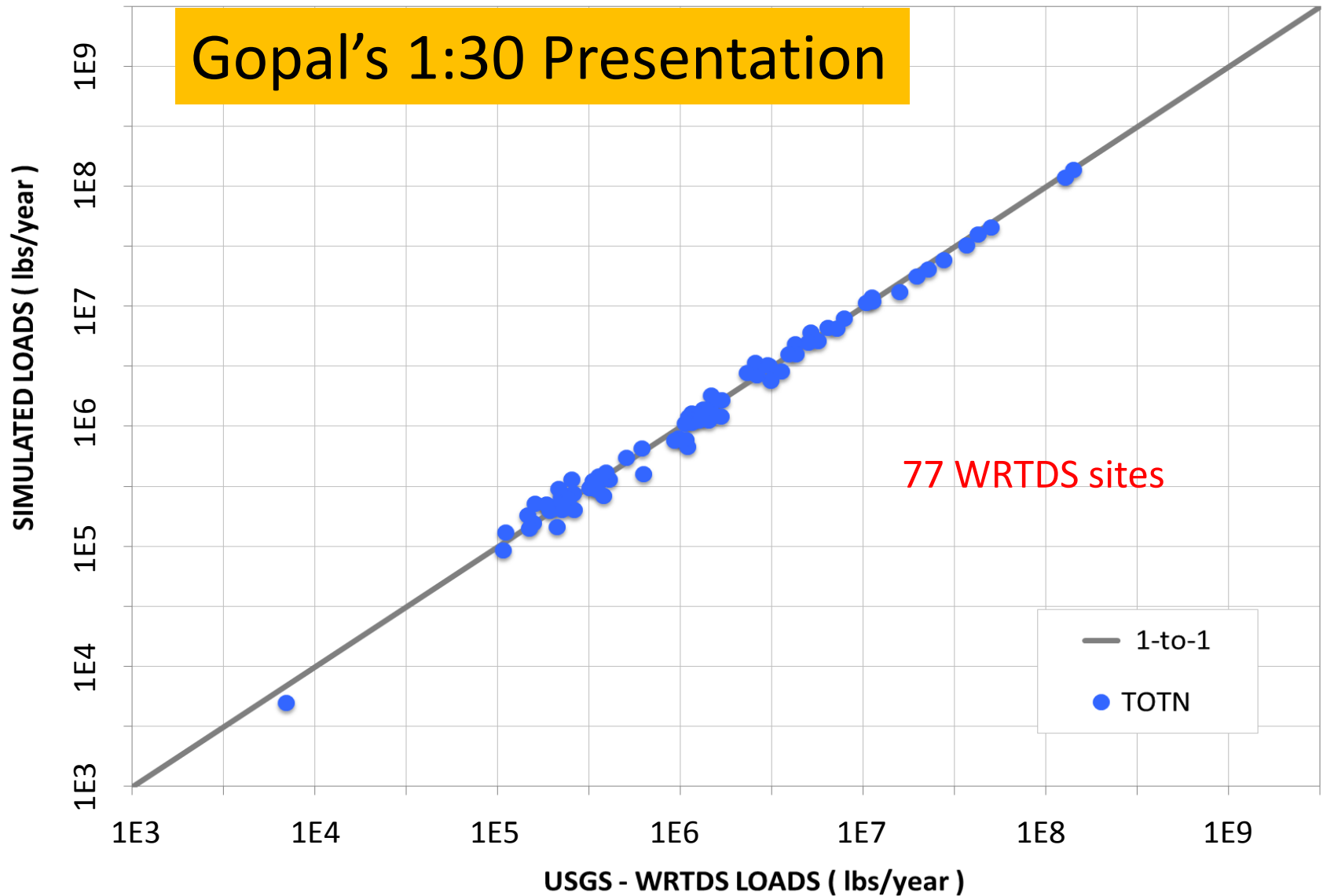
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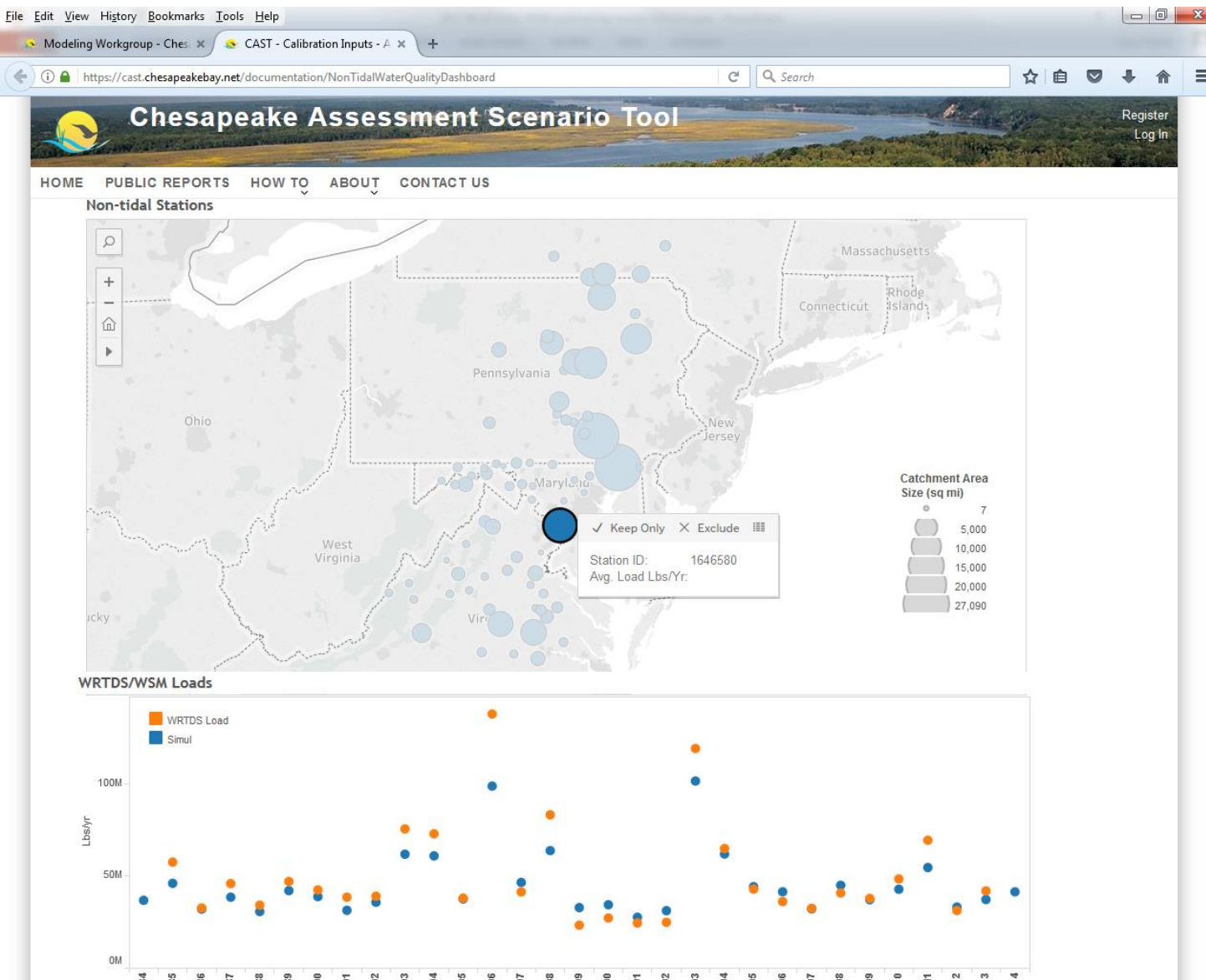
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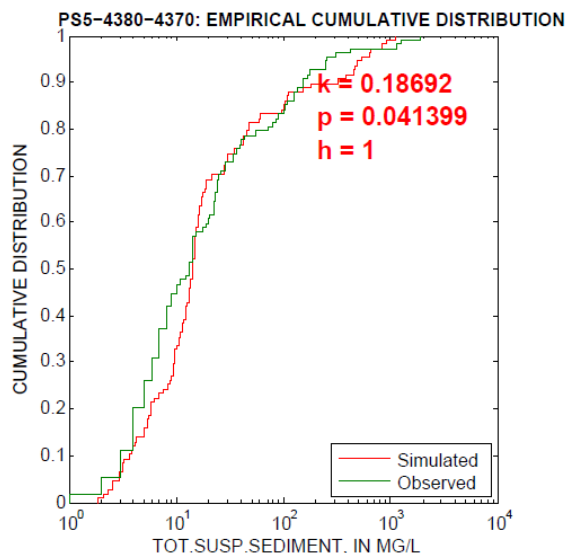
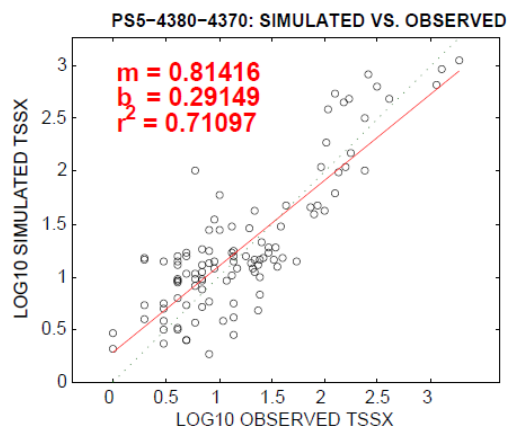
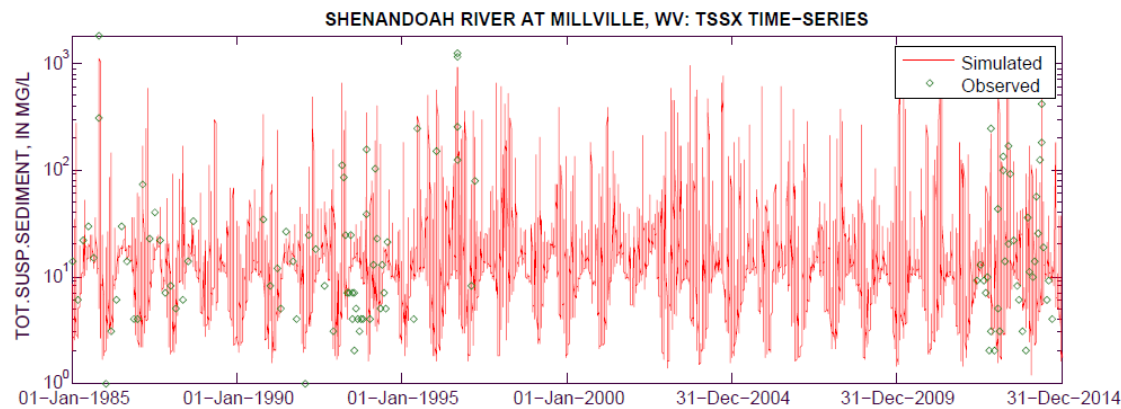
Calibration



Comparison
of WRTDS
and WSM
Annual
Loads

Preliminary Information-Subject to Revision.
Not for Citation or Distribution

Calibration



DATA SELECTION		
scenario		file
P620170331WQ		TSSX.calib
plot		
TSSX - total suspended ...		
Dates	1/1/1985	12/31/201
Drive	Directory	Observed
N/A	model	OBS20161101
STATISTICS		
n	107	107
	observe	simulate
min	1	1.8899
	0	0.276439
mean	79	83.8722
	1.21965	1.28448
media	13	14.088
	1.11394	1.14885
max	1850	1125
	3.26717	3.05115
varian	59483.4	39454.3
	0.455503	0.42468
JB	0.001	0.001
	0.009402	0.003061
	ra	log
%	6.16728	5.31553
err.va	16982.9	0.142719
rel.std.err	0.285507	0.313322
mod.eff	0.714493	0.686678

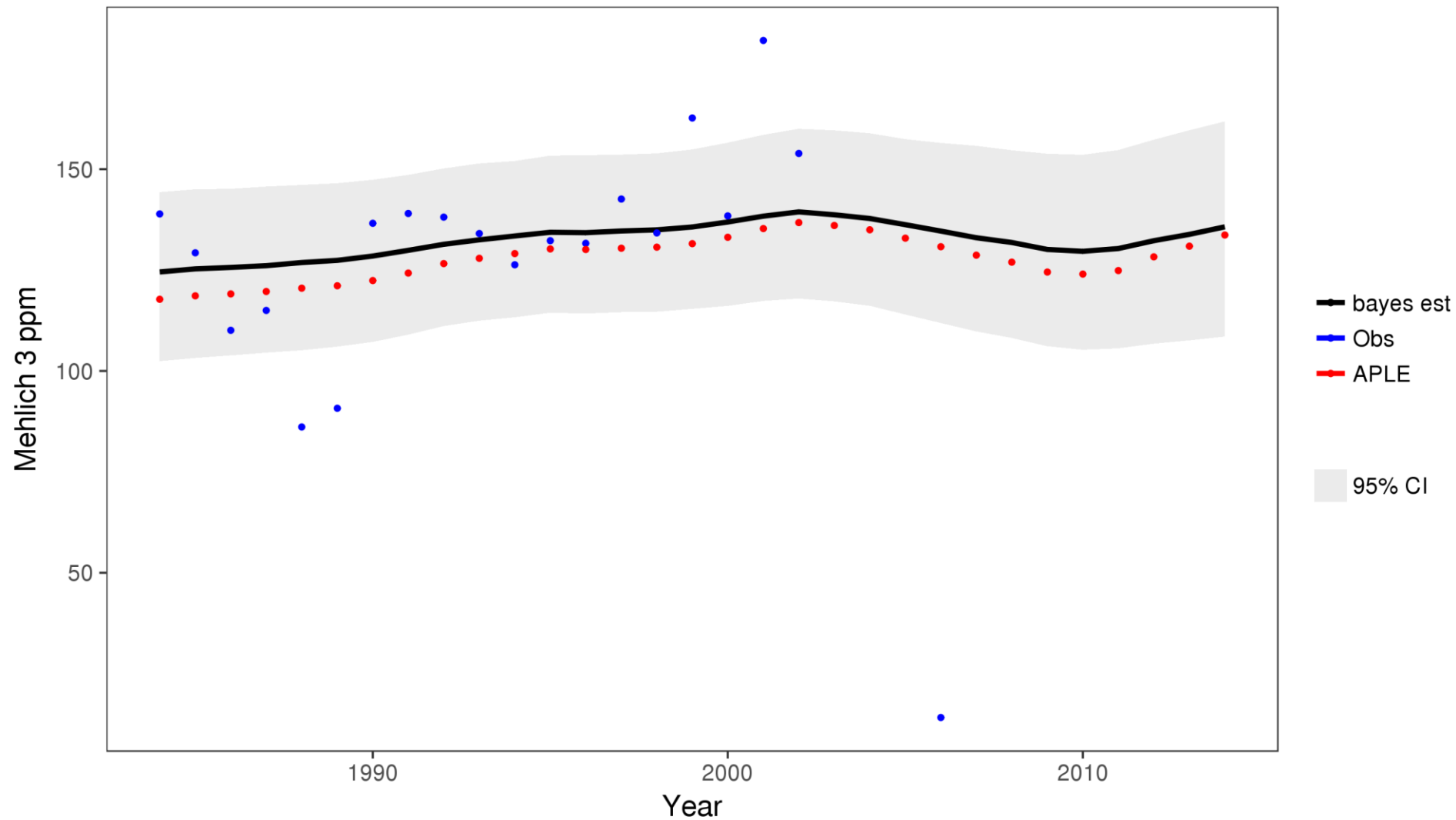
4985 Plots in one file
4985 separate files

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Input Data

- Land use files can be found at this FTP site:
 - https://archive.chesapeakebay.net/Modeling/Phase6/Draft_Phase_6/Land_Use/
- Phase 6 Soil Phosphorus Figures:
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- CAST Homepage (Note: The Phase 6 CAST Beta will be directed here until June 15):
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N24039 Est Soil History



Double Crops in Somerset County, Maryland



Chesapeake Assessment Scenario Tool

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Frequently requested data and information associated with water quality monitoring and modeling.

MODEL DOCUMENTATION

Find additional information about the Phase 6 model, its documentation and links to model review webinars and files.

[Learn More](#)

TRANSITION TO PHASE 6

Get answers to your questions about the transition to the new Chesapeake Bay Partnership's Phase 6 Modeling tools.

[Phase 6 FAQs](#)

SOURCE DATA

Download data tables including information on load sources and agencies, BMPs, animals, geographic references and delivery factors.

[View Source Data](#)

CALIBRATION INPUTS

Find graphs and maps of inputs to the Phase 6 Watershed Model Calibration for all versions.

[View Inputs](#)

BMPs, MODELS & GEOGRAPHY

View additional information on BMPs, CBP Partnership Models, Shapefiles and Geographical Information.

[Learn More](#)

TMDL TRACKING

Information on how to submit progress data via NEIEN and view implementation data on meeting the Chesapeake Bay TMDL.

[TMDL Tracking](#)

OPTIMIZATION

Resources to determine cost effectiveness of BMPs in units of dollars per pound reduced.

[Learn More](#)

RIVER TRENDS

Scientists calculate flow-adjusted trends in nitrogen, phosphorus and sediment levels to better determine whether pollution has changed over time.

[View Trends](#)



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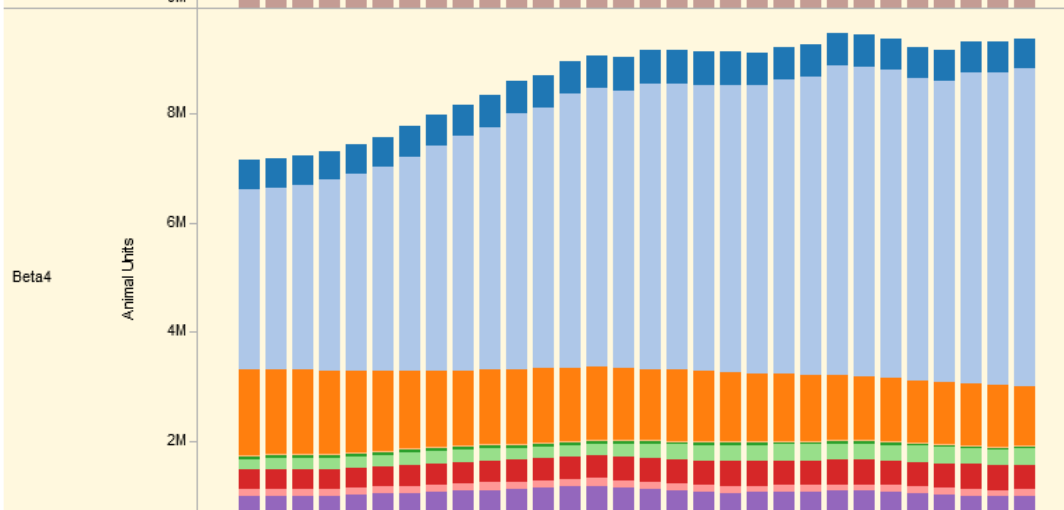
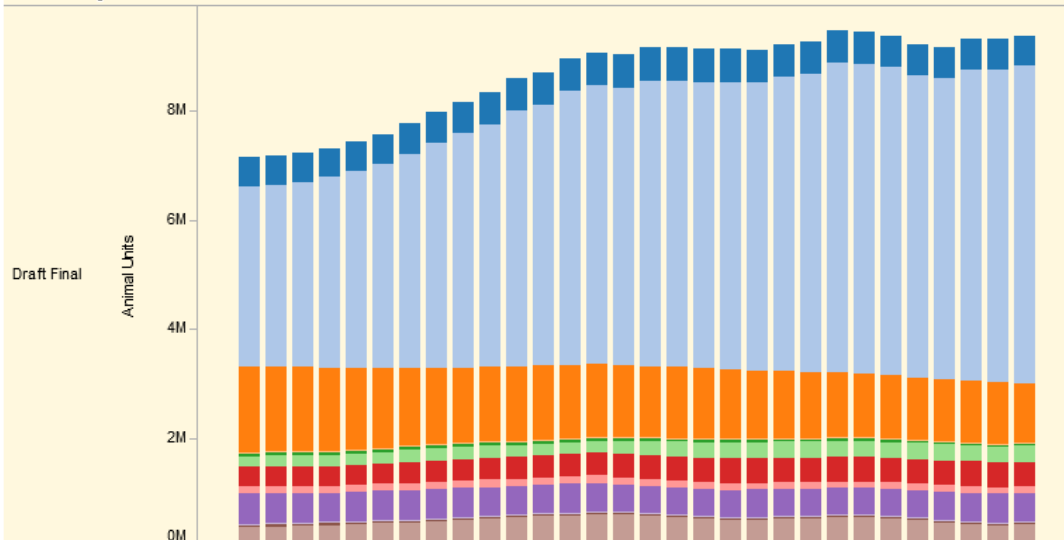
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- beef
- broilers
- dairy
- goats
- hogs and pigs for breed...
- hogs for slaughter
- horses
- layers
- other cattle
- pullets
- sheep and lambs
- turkeys

Animal Units

P6Version

**P6Version**

- ☒ (All)
- ☒ Draft Final
- ☒ Beta4

State

- ☒ (All)
- ☒ DE
- ☒ MD
- ☒ NY
- ☒ PA
- ☒ VA
- ☒ WV

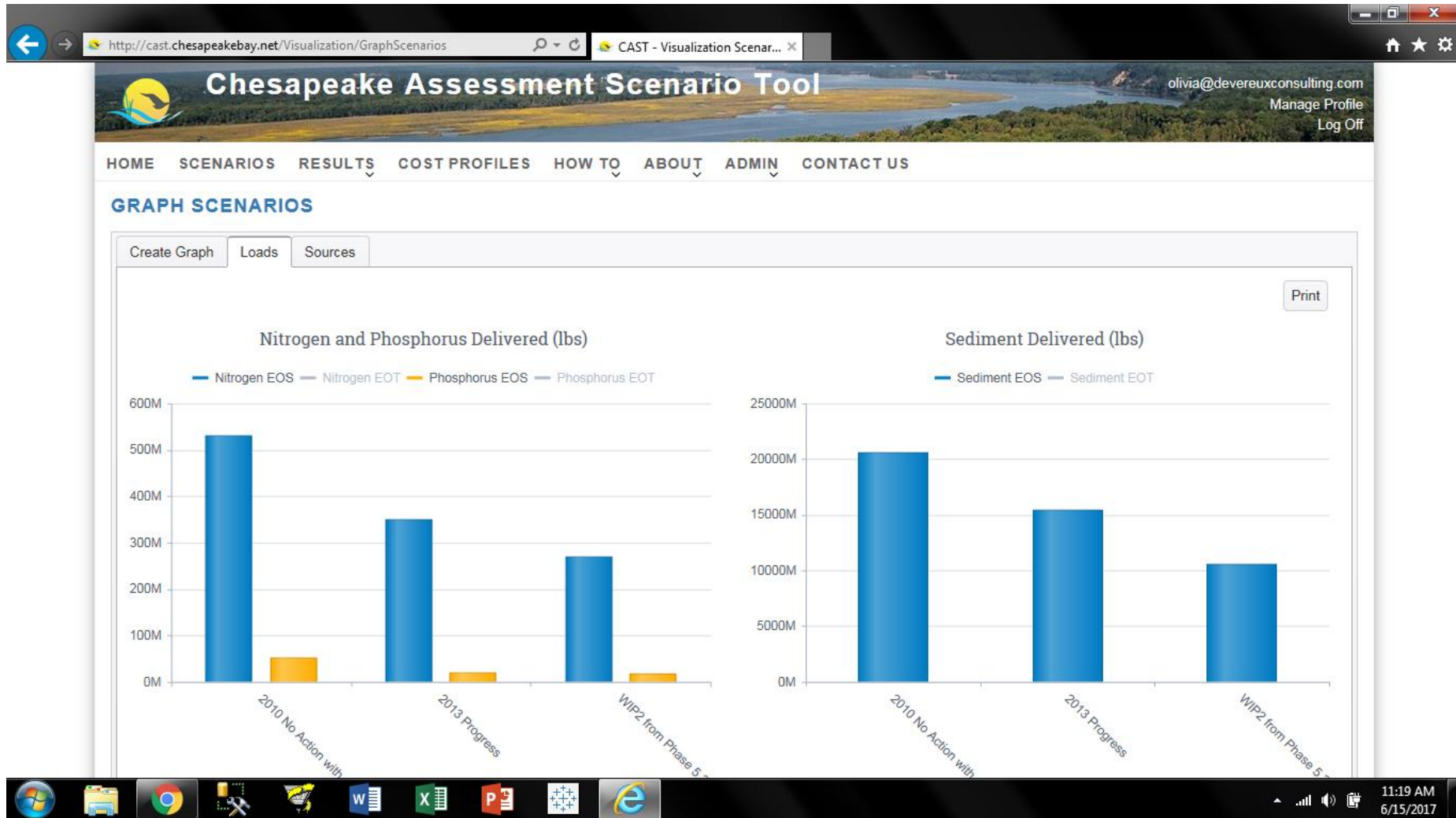
County

- ☒ (All)
- ☒ Accomack
- ☒ Adams
- ☒ Albemarle
- ☒ Alexandria
- ☒ Allegany
- ☒ Alleghany
- ☒ Amelia
- ☒ Amherst
- ☒ Anne Arundel
- ☒ Appomattox
- ☒ Augusta
- ☒ Baltimore
- ☒ Bath
- ☒ Bedford
- ☒ Berkeley
- ☒ Berks
- ☒ Blair
- ☒ Botetourt
- ☒ Bradford
- ☒ Broome
- ☒ Buckingham
- ☒ Buena Vista
- ☒ Calvert
- ☒ Cambria
- ☒ Cameron
- ☒ Campbell

Load Source

- ☒ (All)

CAST Scenarios – Today!!!



Preliminary Information-Subject to Revision.
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Partnership Feedback

- Email to Gary Shenk, Matt Johnston, and/or Lewis Linker
- Different types of feedback
 - Question
 - simple email or phone call
 - not tracked
 - Discussion
 - Series of emails or calls
 - Emails saved and summarized in posted document
 - Proposed Fatal Flaw
 - After discussion
 - Raised to CBP workgroup as proposed fatal flaw
 - Tracked and recorded

Fatal Flaw Review

- June and July – Partnership ‘Fatal Flaw’ Review
 - Criterion #1 – problem with the model
 - Failure to follow partnership instructions
 - Omission of data received by 12/31/2016
 - Overall failure of calibration
 - Illogical results

AND

- Criterion #2 – Significant impairment in the ability to
 - Set planning targets
 - Assess progress

Received so far

- VA: hi-res land use
 - Identified as a fatal flaw by the WQGIT
- VA: animal numbers – under discussion
- Fairfax County: 1987 input values
 - fixed prior to Draft Phase 6
- MDA: Testing Benefits of nutrient management
 - Discussion Exercising CAST
- MDA: Using Crop uptake and crop removal
 - Discussion in AMS
- MDA: Issues for modeling soil P in future scenarios
 - Discussion in AMS

Documentation

- June 1 documentation is finalized
 - Comments may be added to PDFs
 - Additions and Errors document periodically updated
- Edits being made to Final Phase 6 documentation
 - Available on request

Schedule – Watershed Model

- April – July Input Review
- June 1 Calibration and Documentation
- June 15 Scenarios
- June and July Draft Phase 6 review
- July STAC finalizes review
- August Resolution of any fatal flaws
- August Response to STAC review
- August 14 WQGIT decides on Schedule
- September 1? Final Phase 6

Schedule – WQSTM

- June-July Partnership Review
- July 1 Interim calibration
- July STAC finalizes review
- August 1 Final calibration
- August Response to STAC review
- August 14 WQGIT decides on Schedule
- September 15? Final WQSTM

