Shoreline Management
Cover Crops
WIPs, Milestones & Progress

Jeff Sweeney
Environmental Protection Agency
Chesapeake Bay Program Office
jsweeney@chesapeakebay.net
410-267-9844

Watershed Technical Workgroup Meeting
June 6, 2019

WTWG
Agenda

- 10:00 AM – Introductions and Announcements – Ted Tesler, PA DEP
  - Decisions requested: Approval of the March 7 and April 4 meeting minutes.
  - BayTAS retiring
  - Nitrogen Fixation
  - CAST, 2017 Census of Agriculture, 2014-2015 Fertilizer Sales
  - Call for topics
- 10:15 AM – Shoreline Management Expert Panel Recommendations – Jeff Sweeney, EPA CBPO; VA DEQ
- 10:50 AM – Cover Crop Mapping – Jeff Sweeney, EPA CBPO; MDA
- 11:00 AM – Ongoing Discussion of Progress Scenarios, Verification and Model Schedule – Jeff Sweeney, EPA CBPO
  - Jeff will update the workgroup on the status and schedule for draft Phase3 WIPs, data for CAST for the next Milestone period, Progress model scenarios and verification, etc.
- 11:00 AM – Adjourn

WTWG
Agenda

- 10:00 AM – Introductions and Announcements – Ted Tesler, PA DEP
  - Decisions requested: Approval of the March 7 and April 4 meeting minutes.
  - BayTAS retiring
  - Nitrogen Fixation
  - CAST, 2017 Census of Agriculture, 2014-2015 Fertilizer Sales
  - Call for topics
- 10:15 AM – Shoreline Management Expert Panel Recommendations – Jeff Sweeney, EPA CBPO; VA DEQ
- 10:50 AM – Cover Crop Mapping – Jeff Sweeney, EPA CBPO; MDA
- 11:00 AM – Ongoing Discussion of Progress Scenarios, Verification and Model Schedule – Jeff Sweeney, EPA CBPO
  - Jeff will update the workgroup on the status and schedule for draft Phase3 WIPs, data for CAST for the next Milestone period, Progress model scenarios and verification, etc.
- 11:00 AM – Adjourn

Shoreline Management

Expert Panel Report and Methods

- Inconsistency in method possibly introduced with revision of the Expert Panel report to accommodate nutrient reductions associated with managing shoreline erosion
- Report was approved by WQGIT w/ WTWG Technical Appendix

Shoreline Management
Expert Panel Report and Methods

Protocol	Submitted Unit	Total Nitrogen (lbs per unit)	Total Phosphorus (lbs per unit)	Total Suspended Sediment (lbs per unit)
Protocol 1 – Prevented Sediment	Linear Feet	Project-Specific*	Project-Specific*	Project-Specific*
Protocol 2 – Denitrification	Acres of re-vegetation	85	NA	NA
Protocol 3 – Sedimentation	Acres of re-vegetation	NA	5.289	6,959
Protocol 4 – Marsh Redfield Ratio	Acres of re-vegetation	6.83	0.3	NA
Non-conforming/Existing Practices *	Linear Feet	MD = 0.04756 VA = 0.01218	MD = 0.03362 VA = 0.00861	MD = 164 VA = 42

* The WTWG initially recommended reductions for TN and TP be made only after the Modeling Workgroup had an opportunity to evaluate the availability of TN and TP in shoreline sediments in 2017. The WTWG approved the reductions in 2017 following the Modeling Workgroup analysis which estimated an average of 0.00029 lbs TN/lb of TSS and 0.000205 lbs TP/lb of TSS in eroded tidal shoreline sediment. These values can be used directly by jurisdictions for their calculations in Protocol 1, and were adapted for non-conforming/existing practices by multiplying the default TSS reduction for non-conforming projects by the average nutrient concentrations in sediment. Note: the MD numbers also apply to DE and DC. The default rate for sediment is based on fine sediment erosion estimates from Table 3 with a 50% reduction factor applied. The first number applies to MD, DE, and DC and the second number applies to VA.

Shoreline Management
Expert Panel Report and Methods

Protocol 1 – Prevented Sediment

- Step 1. Determine if existing SAV are present. Consult local State Agency for local SAV inventories or conduct on-site sampling.
- Step 2. Estimate shoreline sediment erosion rate
- Step 3. Estimate shoreline restoration efficiency
- Step 4: Adjust prevented sediment load to eliminate coarse grained sand
  - "The final TSS pollutant load reduction should be reduced by the sand component in the sediment prevented by the practice to assure that TMDL credit is not given for reductions in sand, which as previously indicated, can be beneficial"

Shoreline Management

Expert Panel Report and Methods

	Maryland	Virginia
Erosion Rate (lbs/ft/yr)[1]	595	247
Sand Reduction Factor[2]	0.551	0.337
Fines Loading (lbs/ft/yr)	328	83
Fines Loading after Reduction Factor[3]	164	42

[1] Chesapeake Bay shoreline characteristics and shoreline erosion mass loading (averaged) (Halka, 2013); Table 3 in Recommendations of the Expert Panel to Define Removal Rates for Shoreline Management Projects

[2] Chesapeake Bay shoreline characteristics and shoreline erosion mass loading (averaged) (Halka, 2013); Table 11 in Recommendations of the Expert Panel to Define Removal Rates for Shoreline Management Projects

[3] 50% reduction factor because of stability concerns

Shoreline Management

Expert Panel Report and Methods

State	Total Loading (kg/m/d)	Fines Loading (kg/m/d)	Course Loading (kg/m/d)	Sand Reduction Factor
Maryland	2.43	1.34	1.02	0.551
Virginia	1.01	0.34	0.67	0.337
Source: Chesapeake Bay shoreline characteristics and shoreline erosion mass loading (averaged) (Halka, 2013).				

Shoreline Management

Expert Panel Report and Methods

	Maryland	Virginia
Erosion Rate (lbs/ft/yr)[1]	595	247
Sand Reduction Factor[2]	0.551	0.337
Fines Loading (lbs/ft/yr)	328	83
Fines Loading after Reduction Factor[3]	164	42

[1] Chesapeake Bay shoreline characteristics and shoreline erosion mass loading (averaged) (Halka, 2013); Table 3 in Recommendations of the Expert Panel to Define Removal Rates for Shoreline Management Projects

[2] Chesapeake Bay shoreline characteristics and shoreline erosion mass loading (averaged) (Halka, 2013); Table 11 in Recommendations of the Expert Panel to Define Removal Rates for Shoreline Management Projects

[3] 50% reduction factor because of stability concerns

Shoreline Management

Expert Panel Report and Methods

- The Expert Panel felt that projects that were at risk for failure because of slopes greater than the angle of repose should be allowed only 50% of the credit allowed under Protocol 1.
- However, The WQGIT felt that local or state agencies should have the flexibility to give partial or not give any credit based on a site by site basis.
- Therefore, the shoreline management project should provide detailed bank stability analysis to the local reporting agency to document that no additional sediment and associated pollutants will enter the nearshore waters to include the following conditions:
  1) the project was graded and vegetated so that the bank is stable, and
  2) excess sediment was removed offsite so that the sediment does not enter the nearshore waters.

Shoreline Management

Expert Panel Report and Methods

Protocol	Submitted Unit	Total Nitrogen (lbs per unit)	Total Phosphorus (lbs per unit)	Total Suspended Sediment (lbs per unit)
Protocol 1 – Prevented Sediment	Linear Feet	Project-Specific*	Project-Specific*	Project-Specific*
Protocol 2 – Denitrification	Acres of re-vegetation	85	NA	NA
Protocol 3 – Sedimentation	Acres of re-vegetation	NA	5.289	6,959
Protocol 4 – Marsh Redfield Ratio	Acres of re-vegetation	6.83	0.3	NA
Non-conforming/Existing Practices *	Linear Feet	MD = 0.04756 VA = 0.01218	MD = 0.03362 VA = 0.00861	MD = 164 VA = 42

Sand reduction factor was also applied to the nutrients in the sediment. However, the sand portion of the bank material has a much lower nutrient concentration than the silts and clays.

Shoreline Management

Expert Panel Report and Methods

- The Expert Panel seemed to recommend applying the sand reduction factor only to the final TSS credit on the back-end after the TN & TP numbers are computed.
- This information and how it was applied in the example calculations were deleted from the report after the interim approval by the WQGIT until the issues with the Bay Model were ironed out and the TN & TP credits received full approval for Protocol 1.
- Unfortunately, when nutrients were added back into Protocol 1, this sand reduction factor was applied in a different manner than intended.

WTWG
Agenda

- 10:00 AM – Introductions and Announcements – Ted Tesler, PA DEP
  - Decisions requested: Approval of the March 7 and April 4 meeting minutes.
  - BayTAS retiring
  - Nitrogen Fixation
  - CAST, 2017 Census of Agriculture, 2014-2015 Fertilizer Sales
  - Call for topics
- 10:15 AM – Shoreline Management Expert Panel Recommendations – Jeff Sweeney, EPA CBPO; VA DEQ
- 10:50 AM – Cover Crop Mapping – Jeff Sweeney, EPA CBPO; MDA
- 11:00 AM – Ongoing Discussion of Progress Scenarios, Verification and Model Schedule – Jeff Sweeney, EPA CBPO
  - Jeff will update the workgroup on the status and schedule for draft Phase3 WIPs, data for CAST for the next Milestone period, Progress model scenarios and verification, etc.
- 11:00 AM – Adjourn

Cover Crop Mapping

- Attached is a list for your review. It appears that the planting method of "No-Till" was mapped "Other" instead of Conventional which has a code of "D" in SB Name.

Cover Crop Designations
(from MDA)

APPENDIX_ID	BMP_NAME	DEFAULT_SB_LAND_USE	MEASUREMENT_NAME	SB_BMP	New SB_Name
378	Cover Crops	ROW	CANOLA/RAPE Early NO TILL Traditional	CoverCropTradBREO	CoverCropTradBRED
390	Cover Crops	ROW	FORAGE RADISH Early NO TILL Traditional	CoverCropTradFEO	CoverCropTradFED
413	Cover Crops	ROW	CLOVER/WHEAT Early NO TILL Traditional	CoverCropTradLGLEO	CoverCropTradLGLED
463	Cover Crops	ROW	RYE Late NO TILL Traditional	CoverCropTradRLO	CoverCropTradRLD
469	Cover Crops	ROW	RYE Normal NO TILL Traditional	CoverCropTradRNO	CoverCropTradRND
481	Cover Crops	ROW	TRITICALE Early NO TILL Traditional	CoverCropTradTEO	CoverCropTradTED
490	Cover Crops	ROW	TRITICALE Late NO TILL Traditional	CoverCropTradTLO	CoverCropTradTLD
498	Cover Crops	ROW	TRITICALE Normal NO TILL Traditional	CoverCropTradTNO	CoverCropTradTND
343	Cover Crops	ROW	RYEGRASS Early NO TILL Traditional	CoverCropTradAREO	CoverCropTradARED
352	Cover Crops	ROW	RYEGRASS Normal NO TILL Traditional	CoverCropTradARNO	CoverCropTradARND
358	Cover Crops	ROW	BARLEY Early NO TILL Traditional	CoverCropTradBEO	CoverCropTradBED
368	Cover Crops	ROW	BARLEY Normal NO TILL Traditional	CoverCropTradBNO	CoverCropTradBND
422	Cover Crops	ROW	CLOVER/WHEAT Normal NO TILL Traditional	CoverCropTradLGLNO	CoverCropTradLGLND
432	Cover Crops	ROW	SPRING OATS Early NO TILL Traditional	CoverCropTradOHEO	CoverCropTradOHED
442	Cover Crops	ROW	SPRING OATS Normal NO TILL Traditional	CoverCropTradOHNO	CoverCropTradOHND
454	Cover Crops	ROW	RYE Early NO TILL Traditional	CoverCropTradREO	CoverCropTradRED
505	Cover Crops	ROW	WHEAT Early NO TILL Traditional	CoverCropTradWEA	CoverCropTradWED
514	Cover Crops	ROW	WHEAT Late NO TILL Traditional	CoverCropTradWLO	CoverCropTradWLD
520	Cover Crops	ROW	WHEAT Normal CONVENTIONAL Traditional	CoverCropTradWNO	CoverCropTradWND
521	Cover Crops	ROW	WHEAT Normal NO TILL Traditional	CoverCropTradWNO	CoverCropTradWND

Cover Crop Designations
(from CAST)

BMPFullName	BMPShortName
Cover Crop Traditional Brassica Early Other	covercroptradbreo
Cover Crop Traditional Forage Radish Early Other	covercroptradfeo
Cover Crop Traditional Legume Plus Grass 25-50% Early Other	covercroptradlgleo
Cover Crop Traditional Rye Late Other	covercroptradrlo
Cover Crop Traditional Rye Normal Other	covercroptradrno
Cover Crop Traditional Triticale Early Other	covercroptradteo
Cover Crop Traditional Triticale Late Other	covercroptradtlo
Cover Crop Traditional Triticale Normal Other	covercroptradtno
Cover Crop Traditional Annual Ryegrass Early Other	covercroptradareo
Cover Crop Traditional Annual Ryegrass Normal Other	covercroptradarno
Cover Crop Traditional Barley Early Other	covercroptradbeo
Cover Crop Traditional Barley Normal Other	covercroptradbno
Cover Crop Traditional Legume Plus Grass 25-50% Normal Other	covercroptradlglno
Cover Crop Traditional Oats, Winter Hardy Early Other	covercroptradoheo
Cover Crop Traditional Oats, Winter Hardy Normal Other	covercroptradohno
Cover Crop Traditional Rye Early Other	covercroptradreo
Cover Crop Traditional Wheat Early Aerial	covercroptradwea
Cover Crop Traditional Wheat Late Other	covercroptradwlo
Cover Crop Traditional Wheat Normal Other	covercroptradwno

Cover Crop Designations
(from CAST)

BMPFullName	BMPShortName
Cover Crop Traditional Brassica Early Drilled	covercroptradbred
Cover Crop Traditional Forage Radish Early Drilled	covercroptradfed
Cover Crop Traditional Legume Plus Grass 25-50% Early Drilled	covercroptradlgled
Cover Crop Traditional Rye Late Drilled	covercroptradrld
Cover Crop Traditional Rye Normal Drilled	covercroptradrnd
Cover Crop Traditional Triticale Early Drilled	covercroptradted
Cover Crop Traditional Triticale Late Drilled	covercroptradtld
Cover Crop Traditional Triticale Normal Drilled	covercroptradtnd
Cover Crop Traditional Annual Ryegrass Early Drilled	covercroptradared
Cover Crop Traditional Annual Ryegrass Normal Drilled	covercroptradarnd
Cover Crop Traditional Barley Early Drilled	covercroptradbed
Cover Crop Traditional Barley Normal Drilled	covercroptradbnd
Cover Crop Traditional Legume Plus Grass 25-50% Normal Drilled	covercroptradlglnd
Cover Crop Traditional Oats, Winter Hardy Early Drilled	covercroptradohed
Cover Crop Traditional Oats, Winter Hardy Normal Drilled	covercroptradohnd
Cover Crop Traditional Rye Early Drilled	covercroptradred
Cover Crop Traditional Wheat Early Drilled	covercroptradw ed
Cover Crop Traditional Wheat Late Drilled	covercroptradw ld
Cover Crop Traditional Wheat Normal Drilled	covercroptradw nd

WTWG
Agenda

- 10:00 AM – Introductions and Announcements – Ted Tesler, PA DEP
  - Decisions requested: Approval of the March 7 and April 4 meeting minutes.
  - BayTAS retiring
  - Nitrogen Fixation
  - CAST, 2017 Census of Agriculture, 2014-2015 Fertilizer Sales
  - Call for topics
- 10:15 AM – Shoreline Management Expert Panel Recommendations – Jeff Sweeney, EPA CBPO; VA DEQ
- 10:50 AM – Cover Crop Mapping – Jeff Sweeney, EPA CBPO; MDA
- 11:00 AM – Ongoing Discussion of Progress Scenarios, Verification and Model Schedule – Jeff Sweeney, EPA CBPO
  - Jeff will update the workgroup on the status and schedule for draft Phase3 WIPs, data for CAST for the next Milestone period, Progress model scenarios and verification, etc.
- 11:00 AM – Adjourn

Data Input and Planning Deadlines

Phase 3 WIPs

- April 1, 2019

  Deadline for interim BMPs for planning purposes added to CAST.

- April 12, 2019

  Deadline for draft Phase 3 WIP documents and model inputs.

- April 12 – August 9, 2019

  CBPO works with states to design final Land Use Policy BMPs, and publishes a set of draft Land Use Policy BMPs in CAST for use by jurisdictions as they develop their final August 9 Land Use Policy BMP submission

- August 9, 2019

  Final Phase III WIP document and Phase III WIP input decks due to EPA.

Data Input and Planning Deadlines

2018–2019 Milestone Period

- September, 2019

  Jurisdictions are strongly encouraged to begin submitting their BMP implementation data to NEIEN

- December 2, 2019

  QA/QC'd final data to be submitted by jurisdictions for 2019 Progress scenario, including any updates to BMP Verification Program Plans describing new data sources and changes to methods of tracking to CBPO.

Data Input and Planning Deadlines

2018–2019 Milestone Period

- December 2, 2019 – January 31, 2020

  CBPO and jurisdictions will conduct extensive, cooperative QA/QC review of 2019 progress data, including verification.

- January 15, 2020

  Jurisdictions submit final progress for 2018-2019 programmatic milestones to EPA.

- February 8, 2020

  CBPO finalizes 2019 progress model assessment.
  Jurisdictions finalize BMP Verification Program Plans.

Progress and Milestones

Schedule

- There will be two versions of 2019 Progress
  - One to finish 2018-2019 period
  - One to begin 2020-2021 period with new methods and data; historic progress scenarios will be rerun

Data Input and Planning Deadlines

2020–2021 Milestones

- April 30, 2019

  All data from jurisdictional and source sector workgroups that may inform modeling changes for the next milestone period to be submitted to CBPO. Refer to the Potential Data Input Changes section for examples of data that may be submitted.

- June 28, 2019

  All data from non-jurisdictional sources (e.g., USDA, USGS, US Census Bureau, etc.) that may inform modeling changes for the next milestone period to be submitted to, or compiled by, CBPO.

❖ This schedule is, generally, for all future milestone periods unless changed by EPA and/or the Partnership.

Data Input and Planning Deadlines

2020–2021 Milestones

- June 28, 2019

  Data from non-jurisdictional sources

  - USDA-NASS 2017 Census of Agriculture
  - USDA- NASS annual poultry production data
  - USDA-NASS annual crop yield data
  - AAPFCO fertilizer sales

Data Input and Planning Deadlines

2020–2021 Milestones

- June 1 – September 30, 2019

  Draft changes to modeling tools based upon new data are released to workgroups and the Water Quality GIT for consideration, including revised historic progress assessments. Workgroups and Water Quality GIT approve changes to the modeling tools based upon the data on a rolling basis.

❖ This schedule is, generally, for all future milestone periods unless changed by EPA and/or the Partnership.

Data Input and Planning Deadlines

2020–2021 Milestones

- November 1, 2019

  Final changes to modeling tools provided on CAST for use in the 2020-2021 Milestones. Following release of these data, no changes can be made to the modeling tools until October 31, 2021.

- January 15, 2020

  Jurisdictions submit draft 2020-2021 milestones to EPA, and progress on the 2018-2019 programmatic milestones.

❖ This schedule is, generally, for all future milestone periods unless changed by EPA and/or the Partnership.

Milestones

The 'Stopping Rule'

- Data and BMPs used in the Phase 6 Model are subject to change prior to the beginning of each milestone period per PSC decision (7/9/18); however, changes must be limited in scope so that they do not:
  - impact modeled runoff during the 1993-1995 critical period; or
  - alter the base conditions (land uses, septic, animals, etc.) from 1984 through 2013
- Preservation of these estimates will enable the Program to provide a consistent assessment of how new management actions and changes in base conditions have influenced loads over time