Proprietary BMPs in the Chesapeake Bay Program Watershed Model

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1. Process Must Deal W/ Chesapeake Bay Watershed Model

- Panel Recommendations Need to Be Integrated into the Bay Watershed Model:
  - Scale Issues: Delivery Ratios from the Site to the Chesapeake Bay
  - Existing vs. new practice...does it violate the calibration?
  - Double counting issues (has another upstream BMP already removed it?)
  - Over-counting issues (Dealing w/ stormwater but neglecting groundwater)
Phase 5 CBWM in use
Phase 6 CBWM in development

P5 for tracking
P6 for decisions

Phase 5 CBWM retired
Phase 6 CBWM in use
Phase 6 is the likely target

- Timeline of BMP development can be long
- Still can be a part of phase 5 – panels sometimes develop 2
- Can have more freedom to develop complexity
Phase 6

**Nutrients**

- Estimate Spatial Average EOS Based on land use and inputs

**Sediment**

- Update the sediment EOF estimates
- Estimate watershed delivery variance based on landscape parameters

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**Directly Simulated in HSPF for river averaging at least 100 cfs**

**Calibrated to WQ data**
Phase 6

**Nutrients**

- Estimate Spatial Average EOS Based on land use and inputs
- Estimate watershed delivery variance based on landscape parameters
- Estimate small stream effects

Directly Simulated in HSPF

\[
\text{Load} = \text{Calibrated load} + \text{Sensitivity} \times \Delta \text{Inputs} \times \text{BMPs} \times \text{Watershed Delivery Variance Centered on 1} \times \text{Stream Delivery} \times \text{River Delivery}
\]
Phase 6

Precipitation

HSPF

Hydrology submodel
Sediment submodel

Nutrient Submodels

Temporal Nutrient model

BMP Filter

Fertilizer Manure Atmospheric deposition (…)

River
Hydrologic model

- Does the BMP treat the entire flow to streams?
- Just stormwater?
- Just surface?

Precipitation

SURFACE

INTERFLOW

Groundwater
Principles to follow implementing panel recommendations

• Honor the panel recommendations as the accumulation of the best science
• Ensure that it fits within the context of the watershed model
• Ensure that we are modeling in a way that best measures real changes on the ground.
BMP verification

- BMP no longer present/functional and removed from database
- BMP verified/ upgraded with new technology
- BMP lifespan ends – re-verify

Initial Inspection
- BMP installed, verified, and reported by Jurisdiction
- BMP gains efficiency
- Data quality assurance/validation

Follow-up Checks
- BMP nears end of life span
- BMP fully functional
- BMP performance metrics collected