Meeting Maryland Chesapeake Bay TMDL Allocations: Facilitating stakeholder involvement in nutrient modeling

Lee Currey
Maryland Department of the Environment
— August 30, 2011 —
Background

- Nutrient impacts affecting dissolved oxygen
- Sediment impact reducing clarity and impacting SAV
- Six states and DC
- 92 Water quality segments
- Establishment of Total Maximum Daily Load (Pollution Diet)
- Watershed Implementation Plan Phase I and II
Facilitating Stakeholder Involvement

• Need a planning model that can translate management actions into pollutant reductions goals, facilitate decision making and is consistent with regulatory models

• Key features
  – Simplicity
  – Timeliness
  – Transparency
  – Scale
  – Accessibility
  – Accuracy
  – Integration
  – Understanding
Development

- Department of the Environment
- Department of Natural Resources
- Department of Agriculture
- Department of Planning
- University of Maryland
- EPA Chesapeake Bay Program
- Interstate Commission on the Potomac River Basin
- J7 LLC
Estimating Loads

Urban
(land uses/acres/unit loads)

Point Source
(direct input)

Agriculture
(Land uses/acres/unit loads/animals)

Septic
(unit loads, local delivery)

Reduction Practices and Controls
(EPA approved efficiency, BMP sequencing, landuse change and regression equations)

Local Area Loads
(Edge of Stream)

Delivery Factors

Bay Loads
(Delivered to Tidal Waters)
Geographic Input Scales

- **Watershed model MD**
  - >600 segments
  - Based on hydrologic connectivity

- **Water quality**
  - 92 segments/segmentsheds
  - Estuarine water quality

- **Local decision making**
  - WIP Teams
  - 23 counties and the City
  - Planning input scale
Managing Expectations - Scale

<table>
<thead>
<tr>
<th>Landuse</th>
<th>BMP</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>Filtering Practices</td>
<td>10%</td>
</tr>
<tr>
<td>Urban</td>
<td>Tree Planting</td>
<td>15%</td>
</tr>
<tr>
<td>Urban</td>
<td>Wet Ponds</td>
<td>5%</td>
</tr>
<tr>
<td>Crop</td>
<td>Forest Buffer</td>
<td>8%</td>
</tr>
<tr>
<td>Crop</td>
<td>Cover Crops</td>
<td>30%</td>
</tr>
</tbody>
</table>

- **Local Area Planning**
- **Project Site Planning**

- Phase II WIP expectation is local area or watershed planning and not project site level analysis
- Commitment to a level of effort
- Provides flexibility for implementation
Recognizing Local Conditions

- Keep it simple
- Effectiveness at increasing dissolved oxygen
  - Reservoirs
  - Location relative to tidal waters
- Identified effectiveness zones
- Minimized CV
The latest test version was deployed on August 15, 2011. Updates include:

- The capacity to compare among three scenarios has been added. The Compare Scenarios page may be accessed by a link from the Scenario List page.
- Documentation has been updated. There are multiple resources available including tables with information about the BMPs and maps of the sub-county areas.
- Users' scenarios are now permanent.
- Processed water page design completed.
- Scenario for Processed Water required to be added by user to new scenarios. Currently the 2010 load (current) are available to be copied from the public scenario. MDE will also make available: 2017 loads, 2020 loads, and cap loads.

Additional planned refinements include:

- Calculations for animal BMPs will be added. Currently there are no load reductions being calculated for these BMPs.
# Scenario Management

## Your Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>View</th>
<th>Edit</th>
<th>Delete</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agr Test</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wor County</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## Public Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Contact</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009 Progress</td>
<td></td>
</tr>
<tr>
<td>2009 Talbot</td>
<td></td>
</tr>
<tr>
<td>2010 No BMP</td>
<td></td>
</tr>
<tr>
<td>2011 demo</td>
<td></td>
</tr>
<tr>
<td>Forest 2011 Demo</td>
<td></td>
</tr>
</tbody>
</table>

## Processed Water Scenarios

<table>
<thead>
<tr>
<th>Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 Loads</td>
</tr>
<tr>
<td>2017 Loads</td>
</tr>
<tr>
<td>Cap Loads</td>
</tr>
</tbody>
</table>
Building a Scenario

Name and Description

Scale and base year

Existing conditions or alternate scenarios
Working Within a Source Sector

**Pre-BMP Landuse Acres**

<table>
<thead>
<tr>
<th>Pre-BMP Landuse</th>
<th>Non-Federal</th>
<th>Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td>alfalfa</td>
<td>1778.1</td>
<td>49.9</td>
</tr>
<tr>
<td>animal feeding operations</td>
<td>85.4</td>
<td>0.2</td>
</tr>
<tr>
<td>concentrated animal feeding operations</td>
<td>7.6</td>
<td>0</td>
</tr>
<tr>
<td>degraded riparian pasture</td>
<td>46.3</td>
<td>0.2</td>
</tr>
<tr>
<td>hay with nutrients</td>
<td>8804.6</td>
<td>24.4</td>
</tr>
<tr>
<td>hay without nutrients</td>
<td>2150</td>
<td>6</td>
</tr>
<tr>
<td>high till with manure</td>
<td>33204</td>
<td>92</td>
</tr>
<tr>
<td>high till without manure</td>
<td>2226.8</td>
<td>6.2</td>
</tr>
<tr>
<td>low till with manure</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>nursery</td>
<td>308.1</td>
<td>0.9</td>
</tr>
<tr>
<td>nutrient management alfalfa</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>nutrient management hay</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>nutrient management high till with manure</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>nutrient management high till without manure</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>nutrient management low till</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>nutrient management pasture</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>pasture</td>
<td>12565.8</td>
<td>34.8</td>
</tr>
</tbody>
</table>

**Select the BMP you would like to add:**
- Commodity Cover Crop Early Other Wheat

**Select the land use you would like to apply the BMP to:**
- high till with manure
- low till with manure

**Select the geographic scale you would like to use to determine the area for the BMP:**
- County

**Specify which geographic area you would like the BMP applied to:**
- Baltimore

**Enter the percent of acres to apply the BMP to:**
- 25

**Notes:**
- Decision made by ___
Scenario Results

- Forest
- Agriculture
- Septic
- Urban
- Water
- Grand Total

Legend:
- NoBMP
- 2009_Progress
- AddtlReductions

Bar chart showing the scenario results for different categories with comparisons between NoBMP, 2009_Progress, and AddtlReductions.
## MAST Outreach Effort

### Webinars and Training Sessions

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2011</td>
<td>Webinar for Local WIP Teams</td>
<td>What is MAST? How will it be used? Example</td>
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<tr>
<td>May 2011</td>
<td>Webinar for Local WIP Teams</td>
<td>MAST and CBP Land use Handouts</td>
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<tr>
<td>June 2011</td>
<td>Webinar for Local WIP Teams</td>
<td>MAST Training agenda</td>
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<td>July 2011</td>
<td>MAST Training Webinar</td>
<td>Introduction to using MAST and Bay models</td>
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<tr>
<td></td>
<td></td>
<td>Calibration, Scenario development</td>
</tr>
<tr>
<td>July – August 2011</td>
<td>4 MAST Training Sessions at MDE</td>
<td>Hands-on Training for Local WIP Team designees</td>
</tr>
<tr>
<td>August 2011</td>
<td>MAST Training Webinar for Federal Facility Managers and Agency staff</td>
<td>Introduction to using MAST for WIP Scenario development</td>
</tr>
<tr>
<td>August 2011</td>
<td>MAST Training Sessions at MDE for Federal Facility Managers and staff</td>
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Experience with MAST

• Making the information accessible is the first step
• Keep it simple
• Validation and verification
• Expect a varied range of users
• It opens up the “black box”
• Opens up a wide possibility of management solutions
• Facilitates iterative scenario development
• Engages stakeholders
• Confirm final decision scenario(s) with full model

• MAST is modeling made easy, decisions are hard
Contact and Information

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