Using MAST in Local Planning

Gregorio Sandi
MD Department of the Environment
USEPA CBP Watershed Technical Workgroup
December 3, 2012

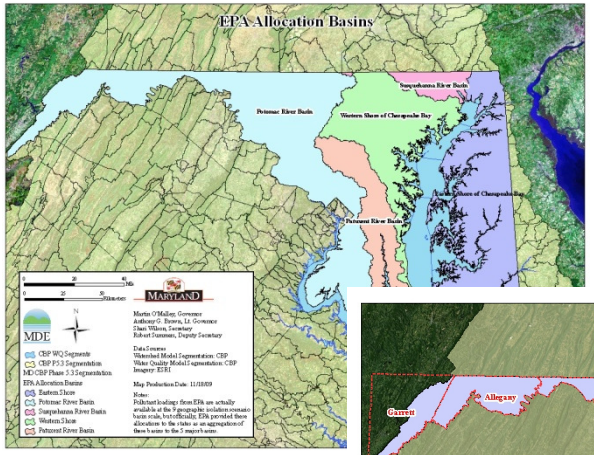
Expectations of MAST

- Provide a simple interface tool
- Accommodate a variety of users
- Open up the “black box” for stakeholders
  - Make the information publically accessible
- Display wide possibilities of management solutions
- Facilitate iterative scenario development
- Engage stakeholders
- Establish a common planning framework

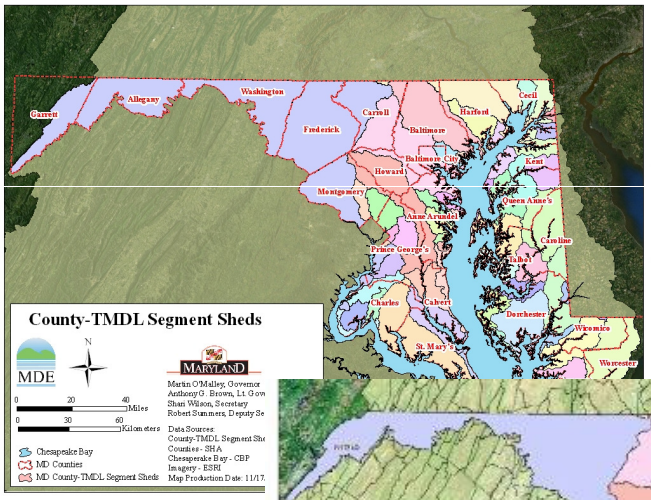
Key Features of MAST

- Consistent with decision making scale
- Internet accessible
- Scenario management
- Links BMPs to load reductions
- Compares load reductions from multiple scenarios
- Provides transparency in Bay TMDL modeling system
- Direct integration into the Bay TMDL modeling system
- Validated as consistent with Bay model

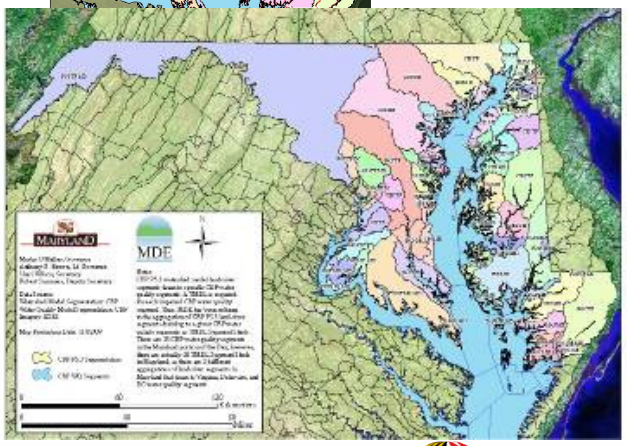
Decision Scales



- EPA Basin Allocations
  - 5 major basins
  - Meet WQ Standards



- Local Area Targets
  - Local decision making
  - Phase II WIP Teams
  - 23 counties and the City



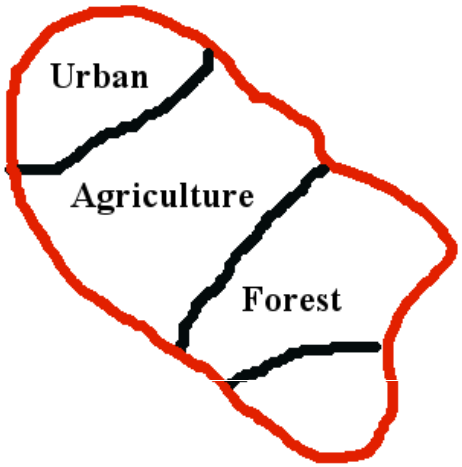
TMDL Allocations

- 53 MD Bay segments
- 58 TMDL segmentsheds
- Estuarine water quality

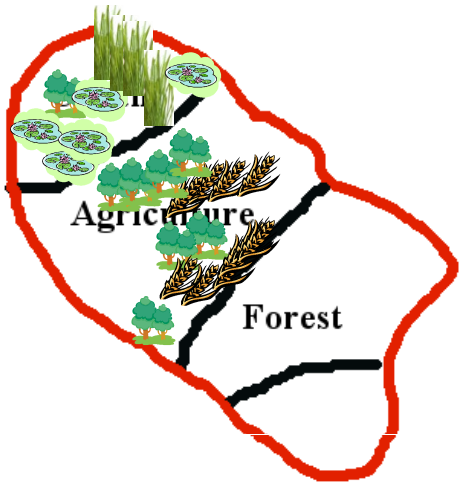
"Real" World Application

- Using MAST in Maryland's Phase II WIP for the Chesapeake Bay TMDL
  - Required extensive outreach and training
  - Facilitated WIP team development of BMP scenarios to meet "local area" reduction targets
  - Allowed for compilation of multiple local scenarios for the State WIP
  - Enabled Maryland to develop model input decks that built upon local WIP team scenarios, as needed

Managing Expectations - Scale



Landuse	BMP	%
Urban	Filtering Practices	10%
Urban	Tree Planting	15%
Urban	Wet Ponds	5%
Crop	Forest Buffer	8%
Crop	Cover Crops	30%

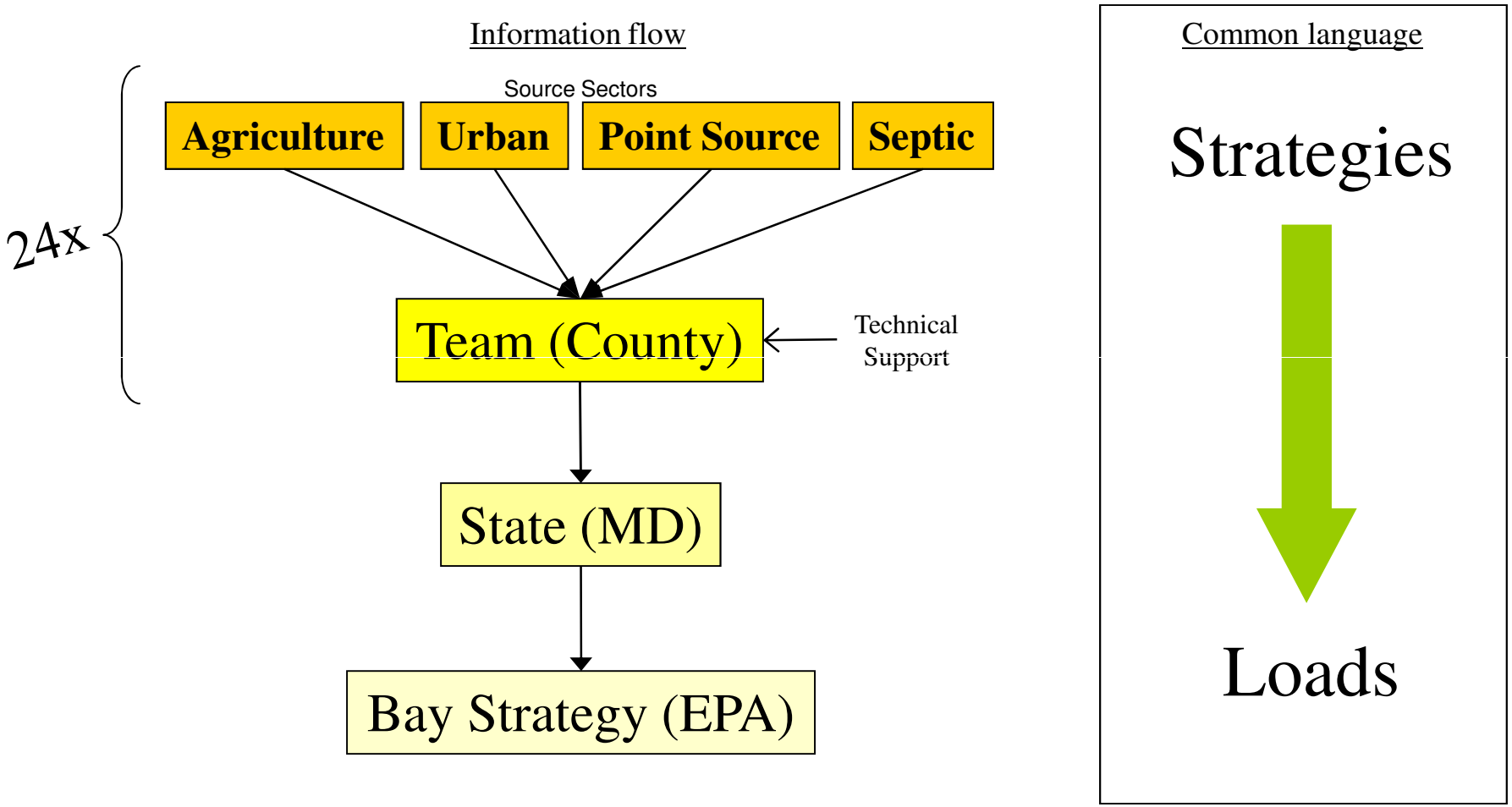


✓ Local Area Planning

✗ 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

Individual WIP Team Scenario



Local Planning

- MAST successfully used in Phase II WIP planning
- Urban – 16 Counties, 2 Cities
- Ag – Statewide and all 23 counties

Urban Scenario

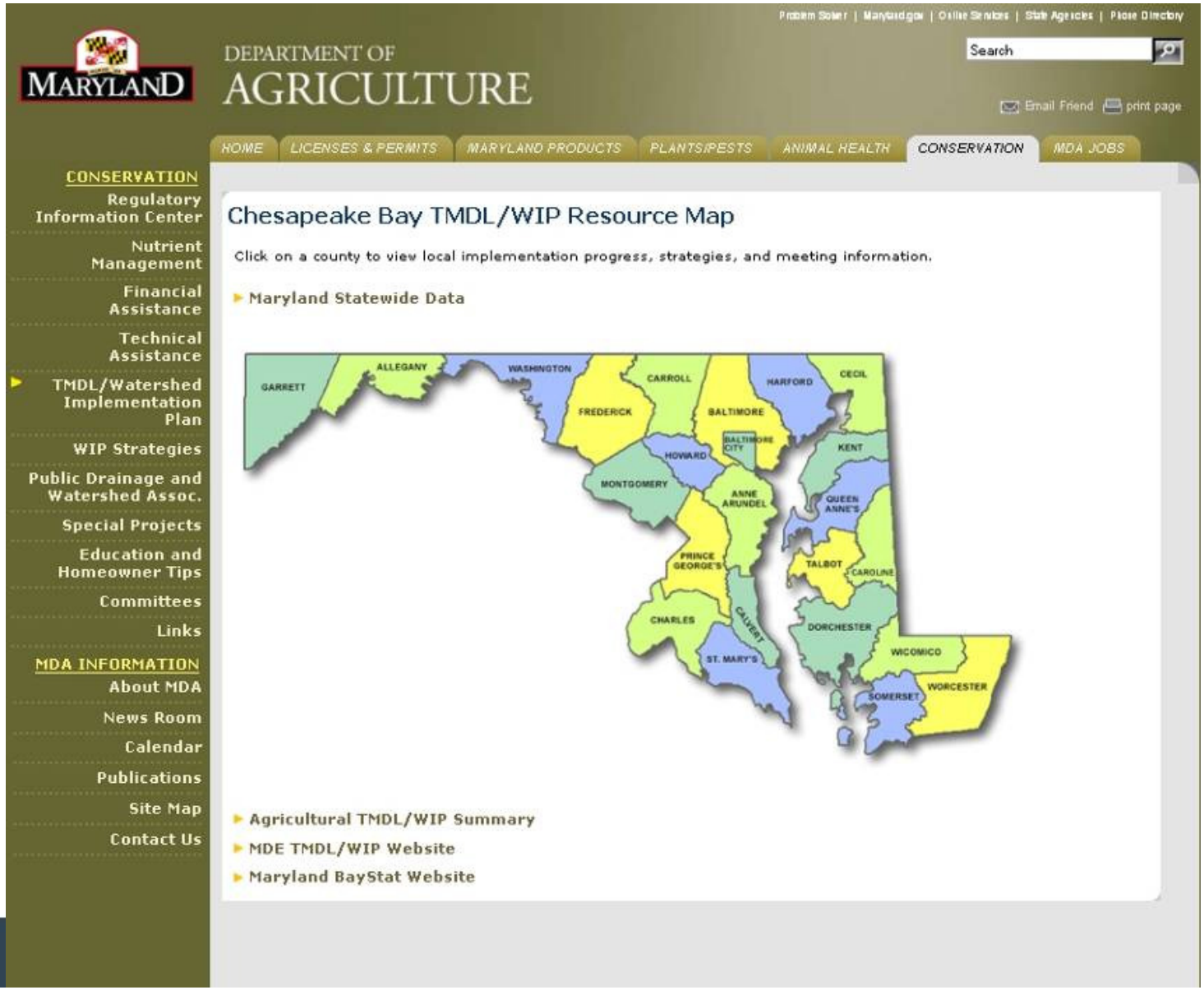
Phase II WIP - County BMP Summary Tables

BALTIMORE CITY, Urban

		TotalCredited					
		2009 Progress (MAST)	2010 Progress (MAST)	2017 Local Inputs (MAST)	2017 WIP (MAST)	2025 Local Inputs (MAST)	2025 WIP (MAST)
Bioretention/raingardens	acres	.	.	4,240	4,202	7,443	7,290
Bioswale	acres	.	.	212	210	207	203
Dry Detention Ponds and Hydrodynamic Structures	acres	236	298	223	221	218	213
Dry Extended Detention Ponds	acres	42	44	42	41	41	40
Erosion and Sediment Control	acres	1,079	408	1,079	1,079	1,079	1,079
Erosion and Sediment Control on Extractive	acres	.	.	.	0	.	8
Forest Conservation	acres	130	132	431	497	431	529
Impervious Urban Surface Reduction	acres	.	.	.	3,300	.	5,355
MS4 Permit-Required Stormwater Retrofit	acres	6,600	6,638	6,903	6,848	6,747	6,606
Stormwater Management by Era 1985 to 2002 MD	acres	.	.	0	0	0	0
Stormwater Management by Era 2002 to 2010 MD	acres	.	.	0	0	0	0
Stormwater to the Maximum Extent Practicable (SW to the MEP)	acres	.	.	.	0	.	0
Street Sweeping Mechanical Monthly	acres	.	.	.	.	2,357	1,889
Street Sweeping Pounds	lbs	.	.	0	0	0	0
Urban Filtering Practices	acres	123	156	858	1,459	2,078	6,033
Urban Forest Buffers	acres	15	16	15	18	15	220
Urban Infiltration Practices - no sand\veg no underdrain	acres	18	20	214	414	622	1,270
Urban Infiltration Practices - with sandveg no underdrain	acres	.	.	0	0	0	0
Urban Nutrient Management	acres	.	7,632	6,817	.	6,460	1,786
Urban Stream Restoration Or Regenerative Stormwater Conveyance	feet	.	.	250,000	407,500	450,000	675,000
Urban Tree Planting; Urban Tree Canopy	acres	.	.	2,091	2,417	3,137	3,814
Vegetated Open Channel - Urban	acres	.	.	0	0	0	0
Wet Ponds and Wetlands	acres	39	39	4,540	4,500	4,428	4,337

MARYLAND
Smart, Green & Growing

http://mda.maryland.gov/resource_conservation/tmdl_wip/index.php



Ag Scenario

Queen Anne's Soil Conservation District
Agricultural Phase II Watershed Implementation Plan

BMPs to be Implemented Annually	Unit	7/1/11-6/30/12 Progress	2013 Milestone	Percentage
Conservation Tillage	Acres/Year	67,429.1	101,776.9	66%
Cover Crop	Acres/Year	46,056.4	46,040.2	100%
Decision Agriculture	Acres/Year	-	-	-
Enhanced Nutrient Management on Crop and Hayland	Acres/Year	109,413.4	96,011.1	114%
Enhanced Nutrient Management on Pasture	Acres/Year	940.4	6,826.7	14%
Manure Transport	Tons/Year	-	1,088.2	0%
Soil Conservation and Water Quality Plans	Acres/Year	76,903.8	63,464.9	121%

Additional BMPs to be Implemented	Unit	Progress	2013 Milestone	Percentage
Alternative Crops	Acres	130.9	110.0	119%
Barnyard Runoff Control	Projects	1.0	1.0	100%
Forest Buffers	Acres	-	18.3	0%
Grass Buffers	Acres	249.4	52.6	474%
Heavy Use Area Protection for Livestock	Acres	-	-	-
Land Retirement	Acres	16.2	18.7	87%
Livestock Waste Storage Structures	Projects	-	1.0	0%
Non Urban Stream Restoration	Linear Feet	-	-	-
Nursery and Greenhouse Runoff Capture and Reuse	Acres	2.0	-	-
Off Stream Watering without Fencing	Acres	-	14.3	0%
Phosphorus Sorbing Materials in Ag Ditches	Acres	4.5	-	-
Poultry Waste Storage Structures	Projects	1.0	1.0	100%
Precision Intensive Rotational Grazing	Acres	-	-	-
Prescribed Grazing	Acres	71.1	57.4	124%
Stream Access Control with Fencing	Acres	1.6	1.8	89%
Water Control Structures (Drainage Ditches)	Acres	-	457.1	0%
Wetland Restoration	Acres	111.8	146.8	76%

BMPs Pending Model Efficiency	Unit	Progress	2013 Milestone	Percentage
Cropland Irrigation Management	Acres/Year	19,643.0	12,900.0	152%
Dairy Manure Incorporation	Acres/Year	651.0	128.6	506%
Poultry Litter Incorporation	Acres/Year	11,485.1	2,672.3	430%
Poultry Litter Treatment	Operations/Year	1.0	4.0	25%
Heavy Use Poultry Area Concrete Pads	Operations	8.0	-	-
Horse Pasture Management	Acres	-	14.3	0%
Mortality Composters	Projects	1.0	1.0	100%
Shoreline Erosion Control	Linear Feet	-	-	-
Vegetative Environmental Buffers on Poultry Operations	Acres	0.4	3.0	14%

Lessons Learned

- MAST makes scenario development easier
- Accuracy of MAST Scale Dependant
  - Works better at larger scales
- Flexibility key to scenario creation
  - Lack of specificity in inputs for small scale planning
- Uses Bay Model Information
  - Does not incorporate local data (i.e. Landuse, BMP #'s)
- The Eastern Shore
- Local planners want cost estimation

Future Uses and Possibilities

- MD is currently using MAST to evaluate potential allocation scenarios for non-tidal and Reservoir nutrient TMDLs
- Considering MAST for interim milestones and progress
- Evaluating the application of MAST for enhancing reasonable assurance of TMDL implementation (i.e., linking BMPs and load reductions)
- Provides an available framework for application with other models