CBP Watershed Model Update Insights from MAST

Presentation to
Water Resources Technical Committee
Sept 8, 2011

Metropolitan Washington Council of Governments

Today's Focus

- Watershed model status
- Some results from MAST (MD – only)
- Future work

CBP Watershed Model Developments

- June 30 – EPA began issuing Phase 5.3.2 scenarios (MD finalizes MAST)
- Month of July:
  - EPA issued draft 2010 Progress scenario – problems concerning data entry (NEIEN)
  - Various other 5.3.2 problems identified (ag nutrient management, anomalies at segment-shed level, regionalization factors)
  - MD conducted MAST training
- August/Sept:
  - A final 2010 Progress Scenario has not yet been approved – delaying issuance of county-level allocations in Maryland
  - EPA conducting Scenario Builder workshops
  - EPA to issue its version of MAST (CAST) - ?

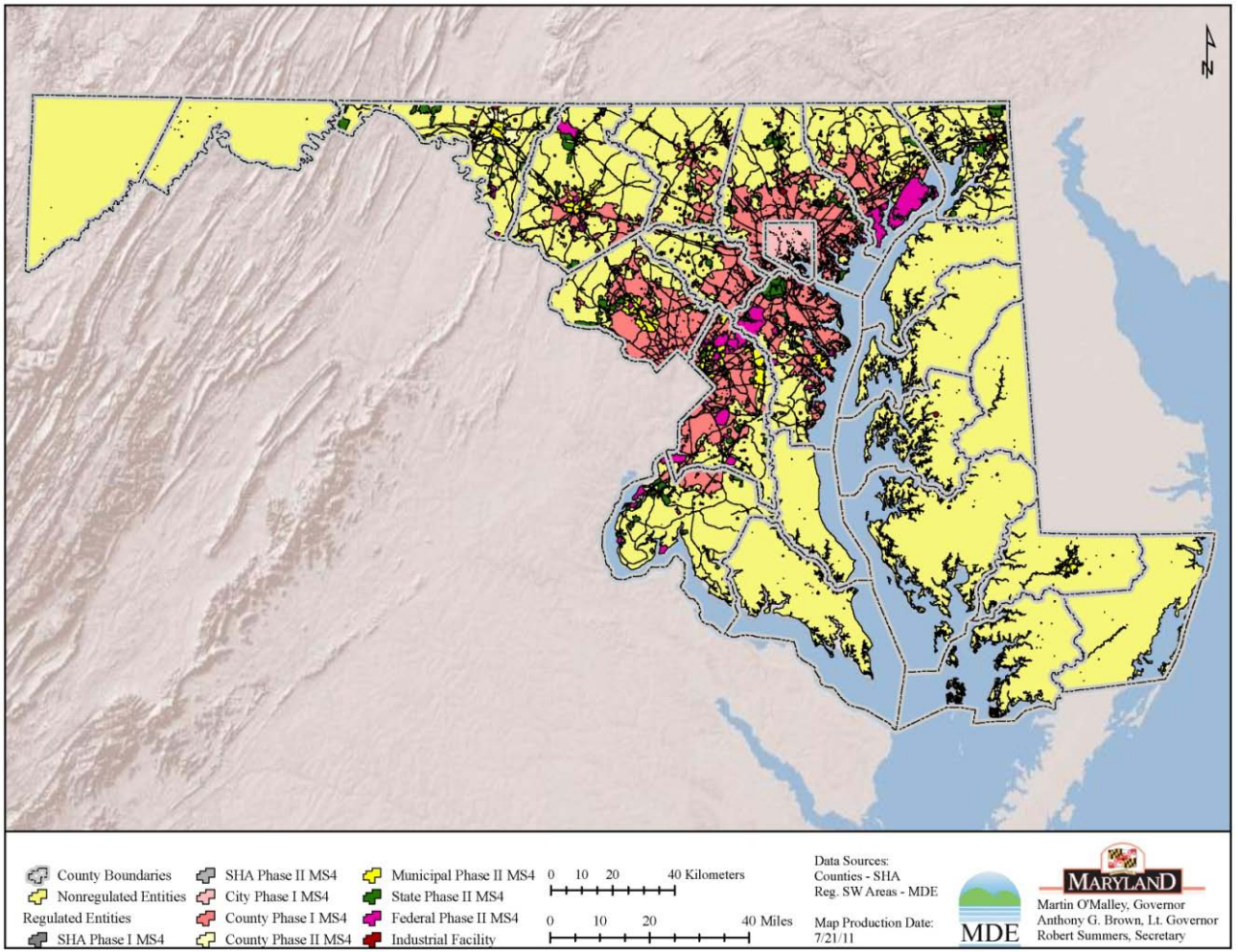
Results from MAST

What is MAST (CAST)

- Maryland Assessment and Scenario Tool (successor to Vortex, COAST)
- Online means of deriving nutrient and sediment load estimates that are consistent with watershed model (**Version 5.3.2**)
- Two main uses
  - Directly estimate loads from different scenarios (close approximation of actual model output)
  - Export files for input into CBP modeling system (via state gatekeepers)
- Developed by ICPRB and J7 for Maryland; Bay Program will tweak to come up with Chesapeake Assessment and Scenario Tool

MDE Urban Land Use

Based on CBP land use, but with new layers (e.g. state highway, created from
state GIS databases



Urban Land Composition - Frederick

	# of Acres	Percent of Total Urban Land
County Phase I/II MS4 Regulated	38497	**45.9**
Federal	567.5	**0.7**
Municipal Phase II MS4 Regulated	22000	**26.2**
Nonregulated Urban	14418	**17.2**
State Highway Phase I/II MS4 Regulated	8065.5	**9.6**
State Phase II MS4 Regulated	298	**0.4**
Total	83,846	**100**

Urban Land Composition - Montgomery

	# of Acres	Percent of Total Urban Land
County Phase I/II MS4 Regulated	114292	**78.7**
Federal	1786	**1.2**
Municipal Phase II MS4 Regulated	14672	**10.1**
Nonregulated Urban	5688	**3.9**
State Highway Phase I/II MS4 Regulated	7971	**5.5**
State Phase II MS4 Regulated	854	**0.6**
Total	**145,262**	**100**

Urban Land Composition – Prince George's

	# of Acres	Percent of Total Urban Land
County Phase I/II MS4 Regulated	97280	**65.2**
Federal	8369	**5.6**
Municipal Phase II MS4 Regulated	25032	**16.8**
Nonregulated Urban	1206	**0.8**
State Highway Phase I/II MS4 Regulated	9761	**6.5**
State Phase II MS4 Regulated	2514	**1.7**
Total	149,189	**100**

Extent of BMP Coverage

County	Percentage of Urban Acres Treated by BMPs	
	Impervious	Pervious
Frederick	41.9	44.4
Montgomery	32.6	40.6
Prince George's	19.9	37.9

Top BMPs:
- Stormwater Management by Era 1985-2002
- Wet Ponds and Wetlands
- Dry Extended Detention Ponds / Dry Detention Ponds with Hydrodynamic Structures

Urban Load Reductions – Current Progress

County		TN (total pounds)	TP (total pounds)	TSS (total pounds)
Frederick	No BMP	822174	40207	22675908
	2009 Progress	741572	34467	17770650
	% reduction	**9.8**	**14.3**	**21.6**
Montgomery	No BMP	1233176	59470	61284018
	2009 Progress	1146513	53050	51735952
	% reduction	**7.0**	**10.8**	**15.6**
Prince George's	No BMP	737260	74956	48722723
	2009 Progress	695470	69064	43306615
	% reduction	**5.7**	**7.9**	**11.1**

All loads shown in delivered pounds

Comparison of Urban Loading Rates

(in pounds/acre)		Frederick	Mont-gomery	Prince George's	State
TN	Impervious	26.15	22.56	9.60	14.20
	Pervious	17.55	13.03	4.97	9.44
	All Urban	19.41	15.39	6.34	10.66
TP	Impervious	2.47	2.10	1.34	1.51
	Pervious	0.62	0.39	0.27	1.02
	All Urban	1.02	0.81	0.59	0.65
TSS	Impervious	1224.37	1363.98	394.29	928.18
	Pervious	193.85	206.45	68.31	141.80
	All Urban	417.43	492.99	165.00	344.00

Calculated from No BMP scenario and edge-of-stream loads to normalize for delivery factors and BMP coverage

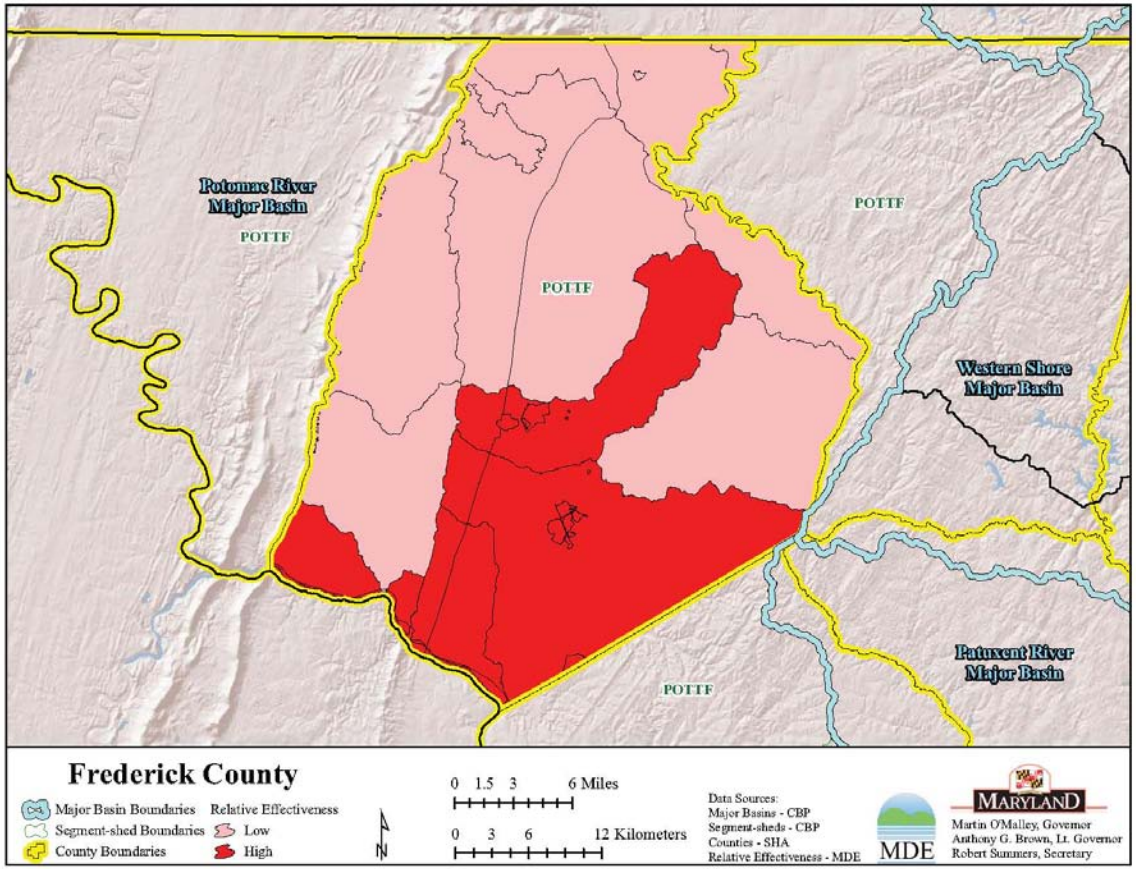
Impact of MS4 Retrofit Requirement*

	Percent reduction from 2009 Progress				
	TN		TP		TSS
County	20 % retrofit scenario	Preliminary target load** (WSM 5.3 results)	20 % retrofit scenario	Preliminary target load** (WSM 5.3 results)	20 % retrofit scenario (preliminary target load not available)
Frederick	5.8	18.5	8.8	31.3	19.7
Montgomery	5.6	16.1	8.5	36.0	18.1
Prince George's	5.5	9.8	8.1	31.6	17.0

* CBP WSM reduction efficiencies of 25% TN, 35% TP and 65 % TSS

** Target Loads will be recalculated when Phase 5.3.2 2010 Progress results available

Differential Delivery Factors



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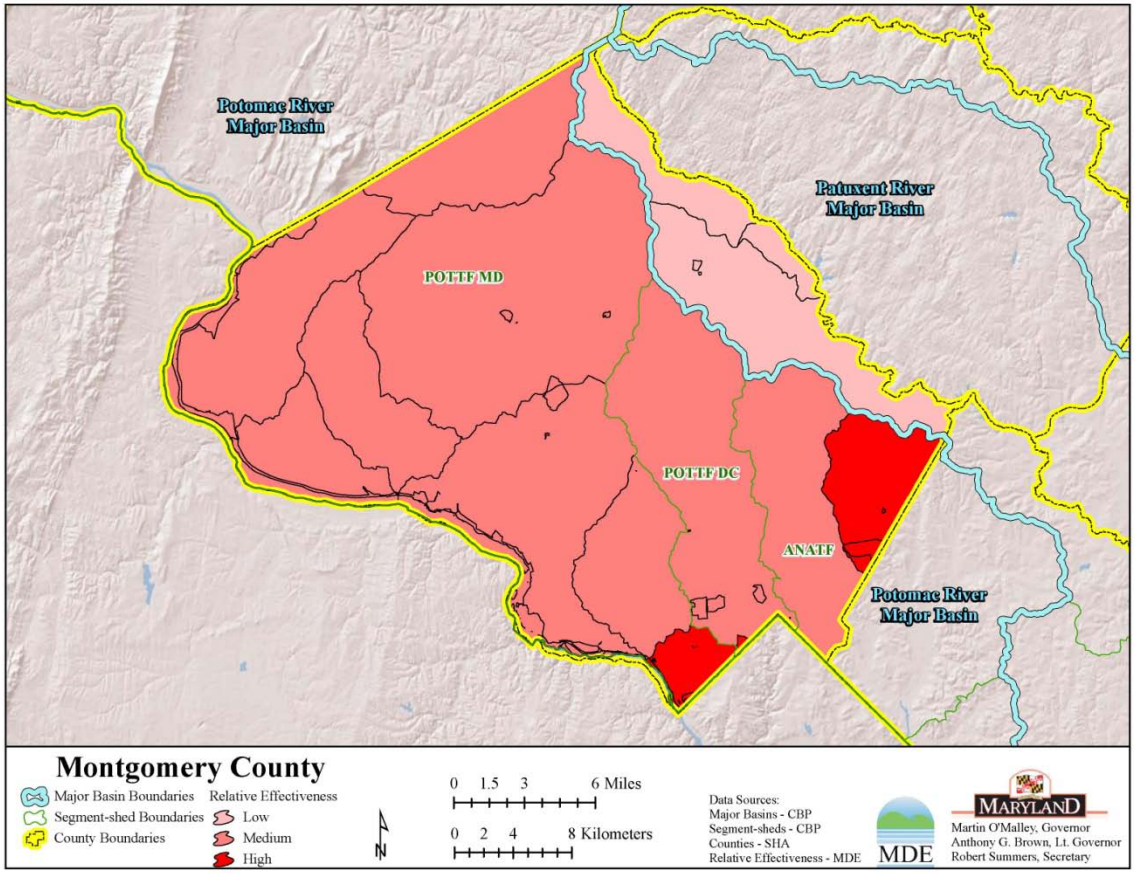

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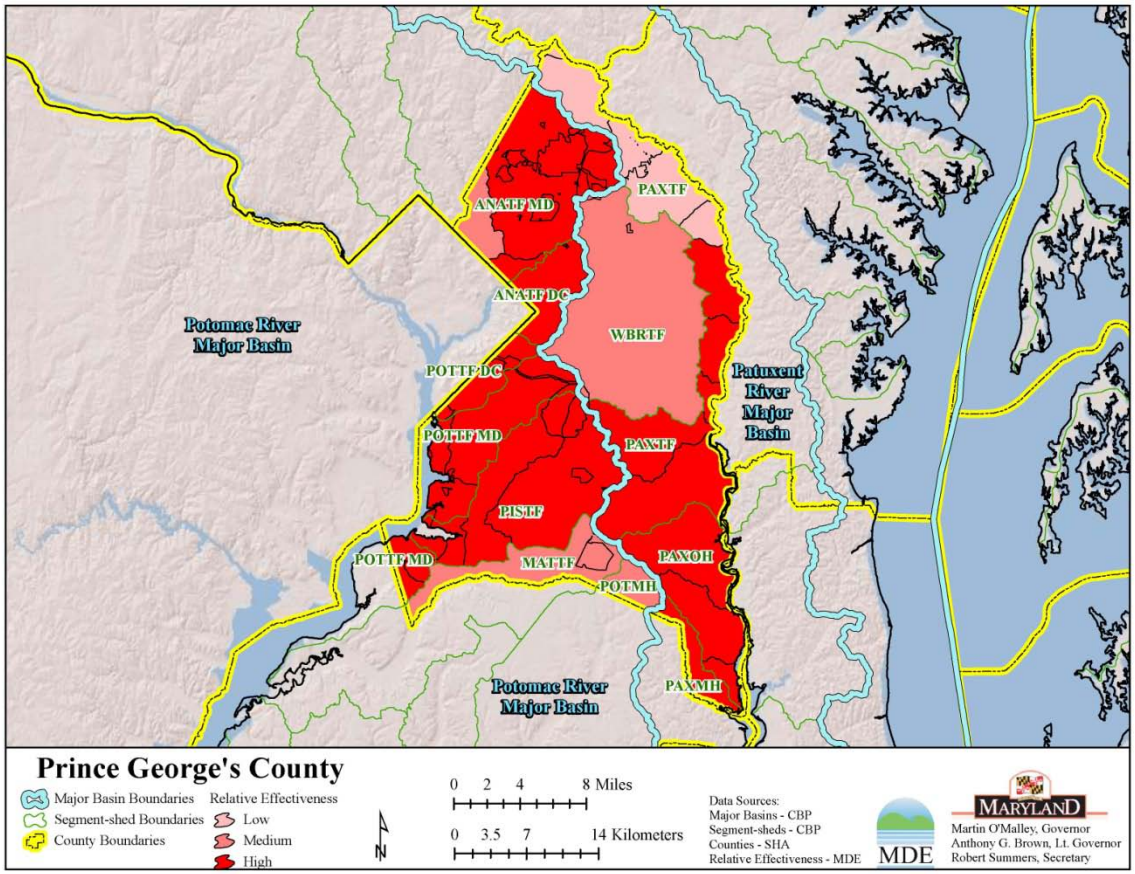

Next Steps

- Document difficulty of reaching targets given current “toolbox”
- Conduct further analysis / raise issue of differing load/acre rates to CBP thru Urban Stormwater Workgroup
- Pursue implications of differing delivery factors on local WIP strategy development
- ???