

MAST

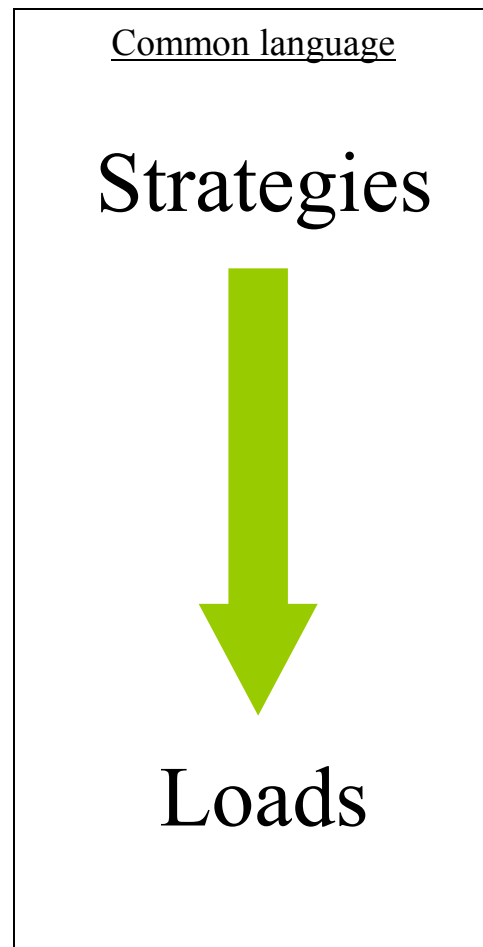
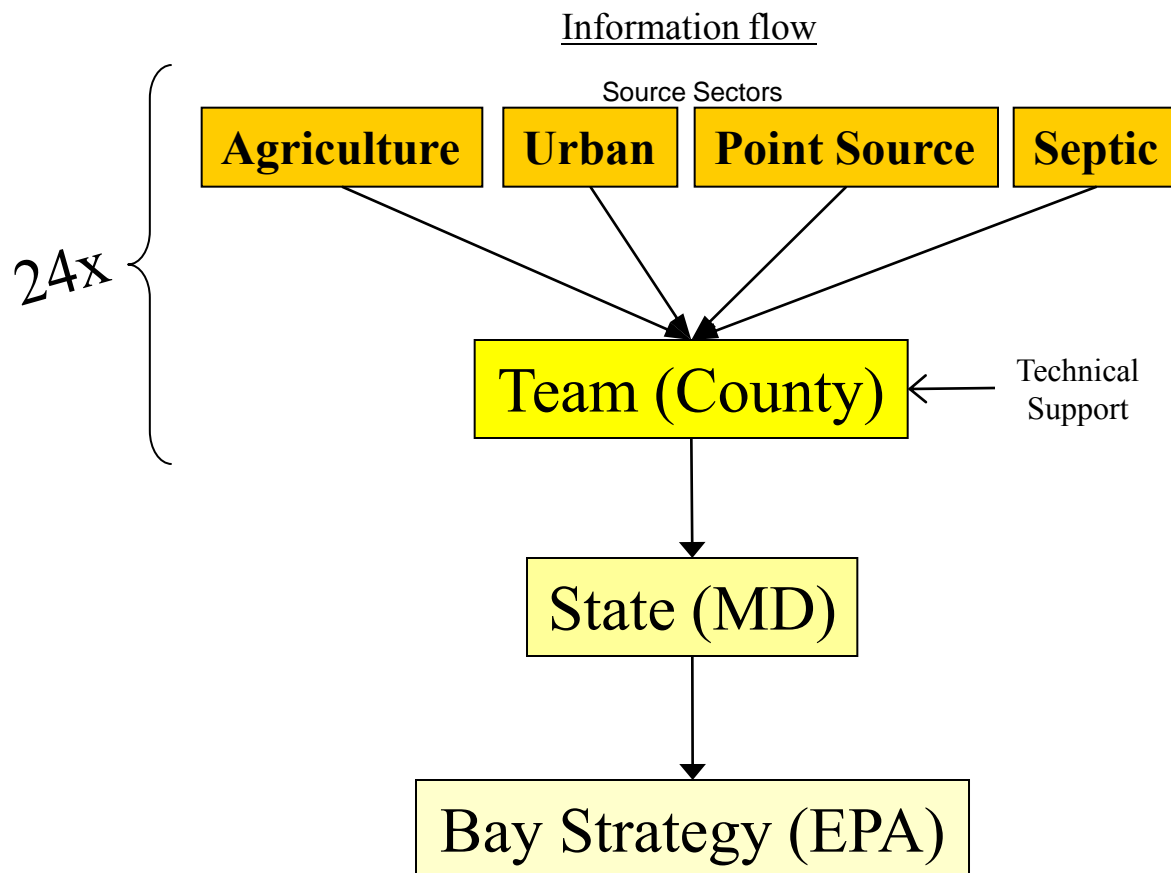
Maryland's Assessment and Scenario Tool

April 13, 2011

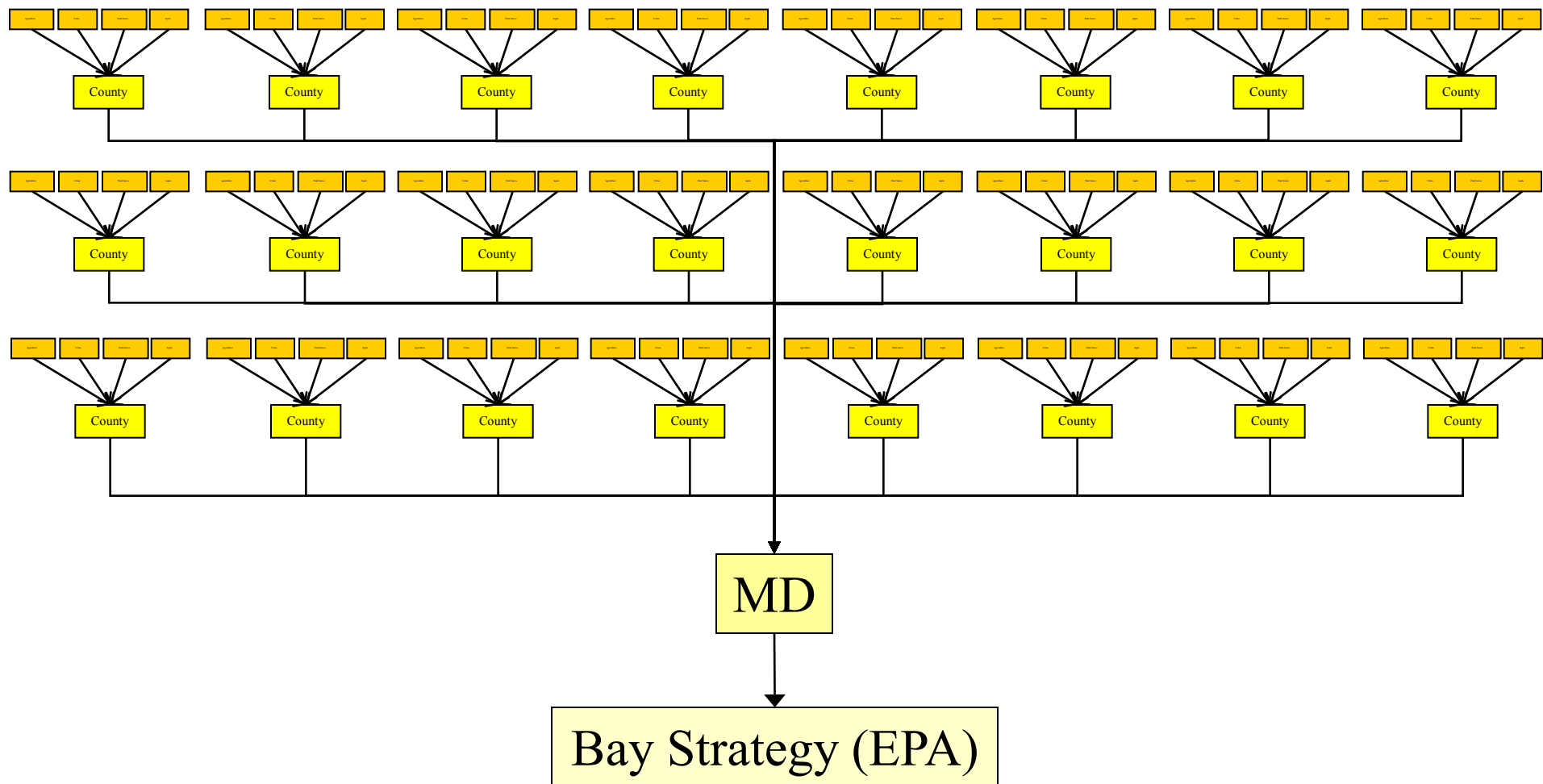
Scenario Development Process

- Modeling
 - Use reduced form model to produce preliminary results
 - Consistent with EPA Bay TMDL models
 - Stakeholder involvement in scenario development
 - Iterative process
- Information Management System to
 - Facilitate consistent and transparent approach
 - Combine WIP Team scenarios for direct input into EPA Bay Model

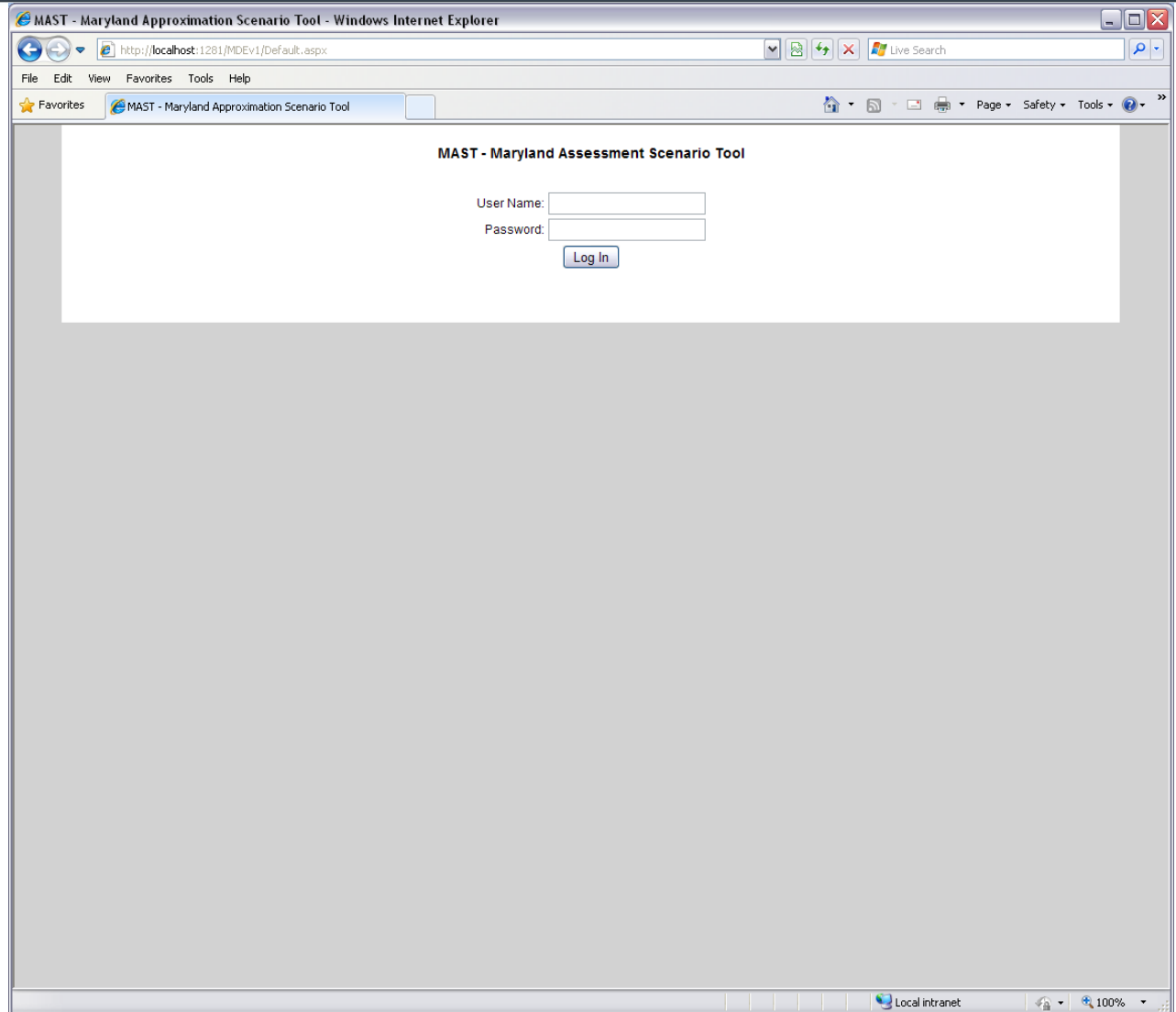
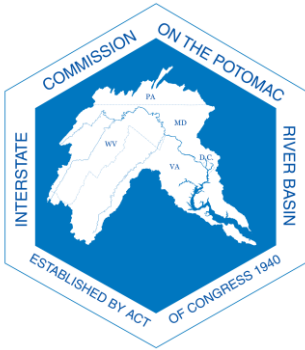
Need for Consistent Process



Need for Consistent Process



Screenshots - Login



Screenshots - Scenarios

Scenario List - Windows Internet Explorer

http://localhost:1281/MDEv1/ScenarioList.aspx

File Edit View Favorites Tools Help

★ Favorites Scenario List

Page Safety Tools >>

Scenarios

[Add Scenario](#)

Your Scenarios

Scenario ▲	
Test Scenario 1	View Edit Delete
Test Scenario 2	View Edit Delete
Test Scenario 3	View Edit Delete

Public Scenarios

Scenario ▲	Contact	Organization	
Test Scenario 3	Jessica Rigelman	J7 LLC	View
test66	Olivia Devereux	ICPRB	View

Done

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Screenshots – New Scenario

Windows Internet Explorer

http://localhost:1281/MDEV1/AddScenario.aspx

File Edit View Favorites Tools Help

★ Favorites Add Scenario

Page Safety Tools

Add New Scenario

Scenario Name:

Description:

Year of Source Data:

Land Unit Type:

Land Units:

- ☐ Allegany
- ☐ Anne Arundel
- ☐ Baltimore
- ☐ Baltimore City

Copy Agricultural BMPs from Scenario:

Copy Urban BMPs from Scenario:

Copy Forest BMPs from Scenario:

Copy Animal Feeding Operations BMPs from Scenario:

Copy Manure Transport BMP from Scenario:

Copy Septic BMPs from Scenario:

Copy Point Source BMPs from Scenario:

Copy Air BMPs from Scenario:

Shared: ☐

Done

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Screenshots – Agriculture

Agricultural BMPs - Windows Internet Explorer

http://localhost:1281/MDDev1/AgricultureBmps.aspx

File Edit View Favorites Tools Help

★ Favorites Agricultural BMPs

Agricultural BMPs

Pre-BMP Landuse	Acres
alfalfa	204
animal feeding operations	153
degraded riparian pasture	1275
hay with nutrients	612
hay without nutrients	561
hightill with manure	510
hightill without manure	408
lowtill with manure	765
nursery	1326
nutrient management alfalfa	816
nutrient management hay	969
nutrient management hitil with manure	867
nutrient management hitil without manure	918
nutrient management lotil	1020
nutrient management pasture	1071
pasture	1122

Pre Bmp Landuse Raw Data

Select the BMP you would like to add:
- Please Select a BMP -

Select the landuse you would like to apply the BMP to:
-

Select the land unit type you would like to use to determine the area for the BMP:
- Please Select a Land Unit Type -

Specify which land units you would like the BMP applied to:
-

Enter the percent of acres to apply the BMP to:
percent

Add

BMP	Landuse	Land Unit	Notes	Amount	Unit	
Commodity Cover Crop Standard-Planting Other Barley	hwm	Maryland		55	percent	Delete
Commodity Cover Crop Standard Other Rye	hom	PU1_3850_4190		9	percent	Delete
Conservation Tillage	HIGHMAN	PU1_3850_4190		9	percent	Delete
Cover Crop Early Drilled Wheat	LOW	MDP		9	percent	Delete
Forest Buffers	ALFALFA	A24001PU0_3871_3690		55	percent	Delete
Non Urban Stream Restoration	AG	MD, West Shore, Lower		0.66	feet	Delete
Non Urban Stream Restoration	FOREST	A24001PU0_3871_3690		55	feet	Delete
Non Urban Stream Restoration	HIGHMAN	APSN		1	feet	Delete

Done

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Comment field to put consistent information that explains rationale behind numbers. Helps manage the large amount of information.

Screenshots – Agriculture

Animal Feeding Operation BMPs - Windows Internet Explorer

http://localhost:1281/MDEv1/AfoBmps.aspx

File Edit View Favorites Tools Help

★ Favorites Animal Feeding Operation BMPs

Animal Feeding Operation BMPs

Animal	# of Animals in AFOs	# of Animals in CAFOs
angora goats	10	10
beef heiffers	10	10
broilers	10	10
dairy heiffers	10	10
hogs and pigs for breeding	10	10
hogs for slaughter	10	10
horses	10	10
layers	10	10
milk goats	10	10
other cattle	10	10
pullets	10	10
sheep and lambs	10	10
turkeys	10	10

[Animal Numbers Raw Data](#)

Select the BMP you would like to add:
 - Please Select a BMP -

Select the animal type you would like to apply the BMP to:
 -

Select the landuse you would like to apply the BMP to:
 - Please Select a Landuse Group -

Select the county you would like the BMP applied to:
☐ Allegany
☐ Anne Arundel

Enter the percent of animals to apply the BMP to:
 -

Add

BMP	Animal Group	Landuse	County	% Animals	N Reduction	P Reduction	
Animal Waste Management System	beef heiffers	CAFO	Allegany	56			Delete
Biofilters	layers	CAFO	Anne Arundel	56	60		Delete
Lagoon Covers	dairy heiffers	AFO	Allegany	45	55		Delete
Poultry Phytase	layers	CAFO	Allegany	45	0	20	Delete

Next

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Screenshots – Agriculture

Manure Transport - Windows Internet Explorer

http://localhost:1281/MDEv1/ManureTransport.aspx

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★ Favorites Manure Transport

Manure Transport

Animal	Tons of Manure in AFOs	Tons of Manure in CAFOs
angora goats	1.3	1.3
beef heifers	7.3	7.3
broilers	0.3	0.3
dairy heifers	86.3	86.3
hogs and pigs for breeding	19.4	19.4
hogs for slaughter	14.3	14.3
horses	21.4	21.4
layers	0.4	0.4
milk goats	1.1	1.1
other cattle	8.7	8.7
pullets	0.2	0.2
sheep and lambs	1.5	1.5
turkeys	1.1	1.1

Select the county you would like to transfer data from:
- Please Select a County -

Select the county you would like to transfer data to:
- Please Select a County -

Select the animal type of the manure being transported:
- Please Select an Animal Type -

Select the landuse manure is being transported from:
- Please Select a Landuse Group -

Enter the tons of manure transported:

Add

Manure Production Raw Data

County Transported From	County Transported To	Animal Group	Landuse	Tons
No records to display.				

Next

Done

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Screenshots – Urban Runoff

Urban BMPs - Windows Internet Explorer

http://localhost:1281/MDEV1/UrbanBMPs.aspx

File Edit View Favorites Tools Help

Urban BMPs

Urban BMPs

Pre-BMP Landuse	Acres
CSS Construction	0
CSS Extractive	0
CSS Impervious	0
CSS Pervious	0
Non-regulated Pervious	467
Non-regulated Impervious	212
Non-regulated Extractive	14
Phase I Industrial Impervious	379
Phase I Industrial Pervious	431
Phase I Municipal MS4 Impervious	2665
Phase I Municipal MS4 Pervious	4871
Phase I SHA MS4 Impervious	56
Phase I SHA MS4 Pervious	22
Phase II Federal MS4 Impervious	146
Phase II Federal MS4 Pervious	532
Phase II Municipal MS4 Impervious	0
Phase II Municipal MS4 Pervious	0
Phase II State MS4 Impervious	0
Phase II State MS4 Pervious	0
Regulated Construction	213
Regulated Extractive	0

Select the BMP you would like to add:
- Please Select a BMP -

Select the landuse you would like to apply the BMP to:
-

Select the land unit type you would like to use to determine the area for the BMP:
- Please Select a Land Unit Type -

Specify which land units you would like the BMP applied to:

Enter the percent of acres to apply the BMP to:
percent

Add

Pre Bmp Landuse Raw Data

BMP	Landuse	Land Unit	Amount	Unit	Notes	
Retrofit	Phase I Municipal MS4 Impervious	Anne Arundel County	30	percent	AA County	Delete
Retrofit	Phase I Municipal MS4 Pervious	Anne Arundel County	30	percent	AA County	Delete
Retrofit	Phase II Municipal MS4 Impervious	Anne Arundel County	5	percent	City of Annapolis	Delete
Retrofit	Phase II Municipal MS4 Pervious	Anne Arundel County	5	percent	City of Annapolis	Delete

Done

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Screenshots – Septic

Septic BMPs - Windows Internet Explorer

http://localhost:1281/MDEV1/SepticBmps.aspx

File Edit View Favorites Tools Help

★ Favorites Septic BMPs

Septic BMPs

Septic Zone	Systems
Outside	32692
Within 1000 ft	36672
Critical Area	15452

[Septic Systems Raw Data](#)

Select the BMP you would like to add:
- Please Select a BMP -

Select the septic zone you would like to apply the BMP to:
- Please Select a Septic Zone -

Select the land unit type you would like to use to determine the area for the BMP:
- Please Select a Land Unit Type -

Specify which land units you would like the BMP applied to:

Enter the percent of septic systems to apply the BMP to:

Add

BMP	Septic Zone	Land Unit	Percent	Notes
Septic Connection	Within 1000 ft	WL0_4390_0000	100	Delete
Septic Connection	Within 1000 ft	WL0_4391_0000	100	Delete
Septic Denitrification	Outside	MDE	56	Delete
Septic Denitrification	Within 1000 ft	A24011EM2_4101_0000	45	Delete
Septic Pumping	Critical Area	A24011EM0_4322_0000	100	Delete
Septic Pumping	Outside	A24005	56	Delete

Next

Done

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Screenshots – WWTP

Point Sources - Windows Internet Explorer

http://localhost:1281/MDEv1/PointSources.aspx

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★ Favorites Point Sources

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Point Sources

Select a facility type:
Federal-Industrial

Select the facilities to apply a BMP to:

- ☐ MD0021598
- ☐ MD0021636
- ☐ MD0067384
- ☐ MD0067423

Select a reduction type:
BNR

Flow: mgd

TN: mg/l

TP: mg/l

TSS: mg/l

Add

Next

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Screenshots – Summary

Scenario Summary Results - Windows Internet Explorer

http://localhost:1281/MDEv1/ScenarioSummary.aspx

File Edit View Favorites Tools Help

★ Favorites Scenario Summary Results

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Scenario Summary Results

Name: Test Scenario 2
Description: tehyythtuj
Source Year: 2010
Date Created: 1/31/2011 10:34:32 AM
Date Last Modified: 3/30/2011 10:09:25 PM

Landuse

Landuse	Pre-BMP Acres	Post-BMP Acres
alfalfa	9	9
animal feeding operations	6	6
CSS construction	90	90
CSS extractive	87	87
CSS impervious developed	84	84
CSS pervious developed	81	81
degraded riparian pasture	72	72
forest	18	18
harvested forest	24	24
hay with nutrients	33	33
hay without nutrients	30	30
hightill with manure	27	27
hightill without manure	21	21
lowtill with manure	42	42
nonregulated extractive	93	93
nonregulated impervious developed	39	39
nonregulated pervious developed	69	69
nursery	75	75
nutrient management alfalfa	45	45
nutrient management hay	54	54
nutrient management hitil with manure	48	48
nutrient management hitil without manure	51	51
nutrient management lotil	57	57
nutrient management pasture	60	60
pasture	63	63
regulated construction	12	12

Done

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Screenshots – Results

Scenario Summary Results - Windows Internet Explorer

http://localhost:1281/MDEV1/ScenarioSummary.aspx

File Edit View Favorites Tools Help

★ Favorites Scenario Summary Results

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Done

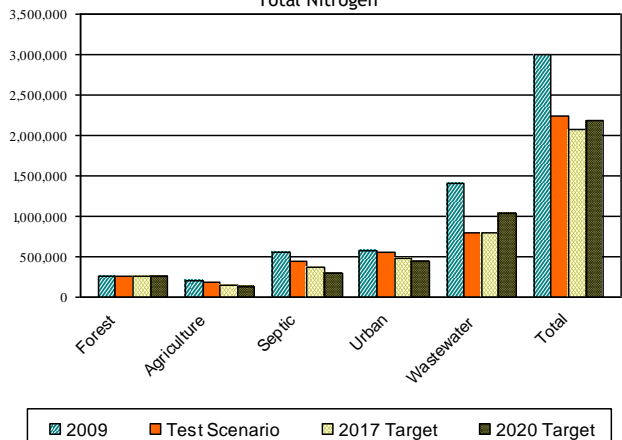
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Loads

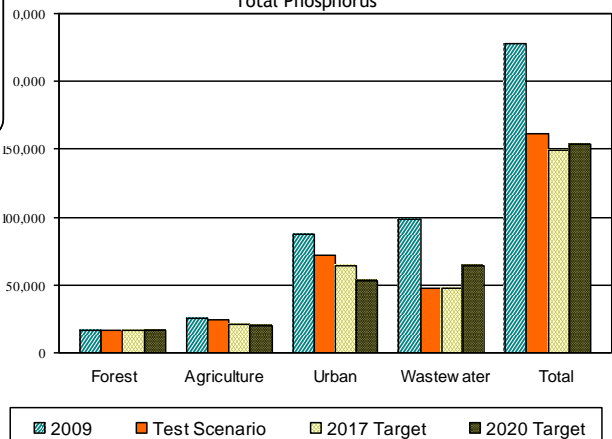
Landuse	Lbs Nitrogen Edge of Stream	Lbs Phosphorus Edge of Stream	Tons Sediment Edge of Stream	Lbs Nitrogen Delivered	Lbs Phosphorus Delivered	Tons Sediment Delivered
alfalfa	742	745	748	645.5	648.1	650.8
animal feeding operations	739	742	745	642.9	645.5	648.1
CSS construction	823	826	829	716	718.6	721.2
CSS extractive	820	823	826	713.4	716	718.6
CSS impervious developed	817	820	823	710.8	713.4	716
CSS pervious developed	814	817	820	708.2	710.8	713.4
degraded riparian pasture	805	808	811	700.4	703	705.6
forest	751	754	757	653.4	656	658.6
harvested forest	757	760	763	658.6	661.2	663.8
hay with nutrients	766	769	772	666.4	669	671.6
hay without nutrients	763	766	769	663.8	666.4	669
hightill with manure	760	763	766	661.2	663.8	666.4
hightill without manure	754	757	760	656	658.6	661.2
lowtill with manure	775	778	781	674.3	676.9	679.5
nonregulated extractive	826	829	832	718.6	721.2	723.8
nonregulated impervious developed	772	775	778	671.6	674.3	676.9
nonregulated pervious developed	802	805	808	697.7	700.4	703
nursery	808	811	814	703	705.6	708.2
nutrient management alfalfa	778	781	784	676.9	679.5	682.1
nutrient management hay	787	790	793	684.7	687.3	689.9
nutrient management hitil with manure	781	784	787	679.5	682.1	684.7
nutrient management hitil without manure	784	787	790	682.1	684.7	687.3
nutrient management lotil	790	793	796	687.3	689.9	692.5
nutrient management						

Diagnostic Plots

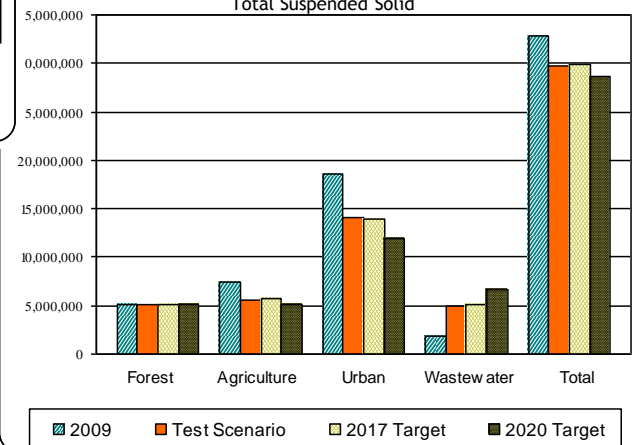
Total Nitrogen



Total Phosphorus



Total Suspended Solid



MAST Training Sessions

- Four sessions to be held at MDE computer room in July
- Six counties per session
 - Need to assign technical liaisons to county (one WIP team member and one state)
 - State technical liaison will work with multiple counties
- Technical support to be provided after July through completion of WIP

Schedule

Description	Date
MD provides Phase I Loads to teams	April 7, 2011
MD provides Phase 5.3.2 input to teams	May 15, 2011
EPA Release 5.3.2 w/ scenarios	June 30, 2011
MAST Release	June 30, 2011
MAST training sessions	July 2011
Revised State allocation from EPA	July 15, 2011
Revised County targets from MDE	August 15, 2011
Draft WIP from County	November 1, 2011
Preliminary Milestones	November 1, 2011
Draft WIP to EPA	December 1, 2011
Final Milestones	January 3, 2012
Public comment begins (30 days) - Tentative	January 15, 2012
EPA provides comments	January 31, 2012
Public comment ends	February 15, 2012
Final WIP to EPA	March 30, 2012