

Recommendations for Chesapeake Bay Program Partnership Phase 6.0 Models

From Building a Better Bay Model: A Workshop for Agriculture Partners, May 22-23, 2013

Prioritized by the Agriculture Workgroup's Agricultural Modeling Subcommittee on September 12, 2013

Priority	Task Category	Task	Line Reference in Detailed Recommendations Sheet
High Priority Tasks	Soils	Characterize how legacy nutrients (especially legacy P) impact nutrient losses from agricultural lands.	59,60,61,62
	Soils	Incorporate soil and nutrient content data into the next version of the Watershed Model. Soils test data is available in annual reports from Maryland and Delaware and in nutrient management plans.	55,56,58
	Manure	Collect and analyze data from industry sources on animal populations, manure and nutrients produced, and mortality rates to update Scenario Builder assumptions. Some sources include: Milk Processor Surveys; Dairy, Calves and Heifers Association; National Pork Board Environmental Committee; Pig Production Environmental Footprint Calculator; Iowa State University; Virginia Tech; Poultry Growers Association	33,34,35,36,38,39,42,44,51
Medium to High Priority Tasks	Manure	Investigate additional sources of data for manure nutrient content and application including: state extension publications; Gilmore and Gilmore, 1992; ASABE Standards; state laboratory results	32,37,39,41,43,46
	Manure	Track annual application of manure through state or other data rather than estimating manure production.	49
	Land Uses	Investigate loading rates for a number of land uses including AFO/CAFOs, trampled riparian pasture, nutrient management lands, etc.	18,19,26,30,31
	Yields	Consider replacing estimated yields with yearly yield values obtained from nutrient management plans or FSA individual farm records.	64,66
	Application	Analyze chemical fertilizer sales data from International Plant Nutrition Institute to estimate amount of fertilizer being applied.	15,17
	Land Uses	Investigate the use of more detailed land use information by using the Cropland Data Layer, USDA-FSA Common Land Units, and local land use data.	20,23,24,27,28,29
	Manure	Collect better litter, manure and biosolids transport data from the states and the industry to better understand how nutrients move around the watershed.	45,50,51
	Application	Analyze farmer surveys completed in Delaware and Maryland which describe biosolids, manure and fertilizer applied to crops.	3,4,15
	Yields	Consider modifying or eliminating the use of theoretical maximum nutrient uptake in Scenario Builder, and using solely local yield data to estimate crop need.	63,65
	Manure	Consider using annual NASS production data where possible to estimate animal populations	47,48
	Soils	Explore soil data for slope and permeability used in USDA-NRCS CEAP modeling.	57
	Land Uses	Compare land uses in the USDA-CEAP project to Watershed Model land uses.	22
	Land Uses	Consider creating a new set of land uses based off of USDA's CDSI land use list.	25
	Application	Investigate extension recommendations for the timing and rates of nutrient applications to crops.	1
	Soils	Investigate mineralization rates in soils and differences in rates between wet and dry years. This info is available from PSWMRU.	54
Application	Investigate the use of nutrient management planning software such as Maryland's NUMAN or similar software being used at Purdue.	5	
Application	Determine crops that need manure and those that do not. Participants stated that some pasture forage types do not receive manure beyond direct deposition.	2	

Each recommendation above may include multiple recommendations from the "Detailed Recommendations" list developed by participants at the Building a Better Bay Model Workshop. Both the summary recommendations and detailed recommendations are organized under different task categories for quick comparisons between the two lists.

Detailed Recommendations for Agriculture Workgroup from Building a Better Bay Model: A Workshop for Agriculture Partners May 22-23, 2013

green = completed	
orange = immediate work needed	
yellow = ongoing	
red = overdue	

Task Category	Task	Recommended By	Date	Recommendation Contact	Datasets Needed	Dataset Contacts	Stakeholder Leads	CBP Leads	Update	Level of Effort	Expected Completion Date	Priority
1 Application	Use Extension recommendations for timing & rates of application based on crop and region.	Nutrient Placement and Usage	5222013			University Extensions		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
2 Application	Determine forage type with pasture nutrient management plans– some need manure, some don't.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
3 Application	Consider using Delaware & Maryland annual reports – which are based on those who are required to obtain NMPs	Nutrient Placement and Usage	5222013		DE/MD AIR			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
4 Application	MD Annual Inventory Reports (AIR): manure & chemical fertilizers by operation – aggregate by basin and type of operation.	Nutrient Placement and Usage	5222013		MD AIR			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
5 Application	Nutrient Management Planning software from MD – NUMAN; similar efforts out of Purdue.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
6 Biosolids	In the model nutrients (biosolids) are being taking away from being a point source and is being assigned to non-point. You should make it part of the waste load allocation for point source before it moves.	Nutrient Placement and Usage	5222013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
7 Manure/Biosolids	Work with states to get best litter tracking information and bio-solids	Poultry Production and Nutrients	5232013			State Ag agency contacts		Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
8 Manure/Biosolids	Collect litter transport data, CAFOs, biosolids, poultry (numbers?) from DEQ.	Nutrient Placement and Usage	5222013		Litter transport	(VA?) DEQ		Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
9 BMPs	Allow stacking of BMPs.	Defining the Landscape	5222013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
10 BMPs	Request NRI data from NRCS from the Bay CEAP and look for opportunities to partner with NRCS.	Planting and Harvesting Crops	5222013		NRCS NRI	NRCS		Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD

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11 BMPs	Use good science and literature reviews for BMP efficiencies worst case vs. "normal" rather than "best professional judgment."	Poultry Production and Nutrients	5232013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
12 BMPs	Better capture widespread use of swine phytase.	Accounting for Swine	5232013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
13 BMPs	Address advanced manure treatment facilities to understand manure availability for land application.	Defining the Landscape Nutrient	5222013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
14 BMPs	Account for irrigated vs non-irrigated crop land – because of the significant yield difference.	Placement and Usage	5222013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
15 Fertilizer	Replace fertilizer use as a SB default with direct representation of fertilizer applications. For MD and DE, use annual implementation reports (AIRs) under NM regulations; For PA, a public-private partnership with PA-4R alliance (CCAs and fert retailers); For VA, use NM data from RMAs (resource management plans); For NY, use NM data from AEM.	Planting and Harvesting Crops	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
16 Fertilizer	Utilize sales information for nutrient content of chemical fertilizer ("look on the label").	Nutrient Placement and Usage	5222013		Fertilizer sales			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
17 Fertilizer	Collect chemical fertilizer data from International Plant Nutrition Institute.	Nutrient Placement and Usage	5222013		Chemical Fertilizer	IPNI: http://www.ipni.net/		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
18 Land Uses	Revisit and revise 15% loss at EOF, look at permitted CAFOs.	Poultry Production and Nutrients	5232013		CAFO			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
19 Land Uses	Something needs to be done with AFO/CAFO ...change name to something else, e.g. "production area" and re-evaluate how acres are calculated.	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
20 Land Uses	Loafing lot is too all-encompassing, recommend looking at c/s programs to specify types of practices.	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
21 Land Uses	Need to get to milk producers, not only poultry – milk is where the large farms are.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High

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22	Land Uses	Compare land uses between CBP Watershed Model and USDA-CEAP's.	5222013	Defining the Landscape	Matt Johnston	CEAP land uses	Lee Norfleet	Mark Dubin; Matt Johnston; Peter Claggett	May 22, 2013 - Proposed at Building a Better Bay Model Workshop			Medium - High
23	Land Uses	Investigate Cropland Data Layer and determine if it is possible to use CDL in defining geographic distribution of land uses.	5222013	Defining the Landscape	Matt Johnston	CDL through time	Morgart; Craig Goodwin	Mark Dubin; Matt Johnston; Peter Claggett	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
24	Land Uses	Work with the states to gather local agricultural land use data.	5222013	Defining the Landscape	Matt Johnston	Multiple local land use datasets	State Ag Agency Contacts	Mark Dubin; Matt Johnston; Peter Claggett	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
25	Land Uses	Define new agricultural land uses using the USDA's CDSI land cover as a guide.	2142013	Defining the Landscape	Mark Dubin; Dana York	NA	NA	Mark Dubin; Matt Johnston; Peter Claggett	May 22, 2013 - Proposed at BBBM Workshop; February, 2013 - Recommended at AgWG meeting			Medium - High
26	Land Uses	Define loading rates for new all new agricultural land uses.	2132013	Defining the Landscape	Mark Dubin	Full literature review needed for each land use.	NA	Mark Dubin; Matt Johnston; Peter Claggett	May 22, 2013 - Proposed at BBBM Workshop; February, 2013 - Recommended at AgWG meeting			Medium - High
27	Land Uses	Better account for Nutrient Management systems: use general crop land use categories.	5222013	Defining the Landscape				Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
28	Land Uses	Explore use of USDA-FAS 5708 data, Common Land Unit (CLU) data.	5222013	Defining the Landscape		USDA-FAS 5708		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
29	Land Uses	Investigate simplification of Scenario Builder by restructuring Land Use segments through aggregated crop production systems data.	5222013	Planting and Harvesting Crops				Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
30	Land Uses	Trampled Riparian Pasture (TRP) doesn't appropriately reflect what's going on. Perhaps reclassify Land Use as riparian and categorize areas by use within pasture.	5232013	Measuring the Impacts of Dairy and Beef				Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop		8012013	Medium - High
31	Land Uses	If not removing TRP, reevaluate 9x manure deposition figure.	5232013	Measuring the Impacts of Dairy and Beef				Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop		10012013	Medium - High

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32 Manure	Approach ASABE to utilize their standards review process (standard D-384.2).	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop		1012014	Medium - High
33 Manure	Capture milk production, Milk Urea Nitrogen testing data, and animal numbers to better track nitrogen loads (data from surveys and milk processors).	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop		1012014	High
34 Manure	Use industry benchmarks for mortality (seem to be less than 6%) –dairy, calves & heifers association	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop		1012015	High
35 Manure	Data from National Pork Board Environmental Committee	Accounting for Swine	5232013			Allan Stokes		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
36 Manure	Data from Pig Production Environmental Footprint Calculator	Accounting for Swine	5232013			Allan Stokes		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
37 Manure	Update manure nutrient content data by animal type – better account for genetic improvements and carefully designed rations to match age, stage, gender, etc of hogs	Accounting for Swine	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
38 Manure	Consider outside or other data sources (ISU or VT)	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
39 Manure	Develop mechanism to assess how to use these other data sources and apply them in confirmation system.	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
40 Manure	Establish confirmation system to verify AgCensus against other data sources.	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
41 Manure	Collect generalized manure data by state from extension publications.	Nutrient Placement and Usage	5222013			University Extensions		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
42 Manure	Collect manure data from poultry integrators.	Nutrient Placement and Usage	5222013				Paul Bredwell	Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
43 Manure	Gilmore & Gilmore 1992 report – shows different rates of litter decomposition	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High

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44 Manure	Data: N model from EPA(?) (Jim Galloway) to better estimate changes in manure load/concentration over time.	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
45 Manure	Incorporate transport data from SWAT modeling.	Nutrient Placement and Usage	5222013		Litter transport data SWAT?			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
46 Manure	Collect manure data from state labs: use data generated from state labs outside of Bay watershed.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
47 Manure	Explore the use of Agri-Stats and USDA-NASS annual manure data.	Nutrient Placement and Usage	5222013		Annual manure data	Agri-Stats and USDA-NASS		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
48 Manure	Use NASS production trends/trends for the model or for comparison. • Productions trends for current model. • Production data for new model	Poultry Production and Nutrients	5232013		NASS production trends			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
49 Manure	Track annual application of manure rather than manure generation.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
50 Manure/Biosolids	Work with states to get best litter tracking information and bio-solids	Poultry Production and Nutrients	5232013			State Ag agency contacts		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
51 Manure/Biosolids	Collect litter transport data, CAFOs, biosolids, poultry (numbers?) from DEQ.	Nutrient Placement and Usage	5222013		Litter transport	(VA?) DEQ		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
52 Misc.	Better tracking of wildlife numbers and contributions	Accounting for Swine	5232013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
53 Misc.	Coordinate uniform data collection amongst jurisdictions.	Defining the Landscape	5222013					Agriculture Workgroup/Mark Dubin	May 22, 2013 - Proposed at BBBM Workshop			TBD
54 Soils	Mineralization rates – wet vs dry years – info available from Curtis Dell PSWMRU at Penn State	Nutrient Placement and Usage	5222013			Curtis Dell		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
55 Soils	Enable the use of nutrient data on different modeling scales.	Defining the Landscape	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High

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56 Soils	Use USGS monitoring water quality data for both surface and subsurface monitoring, specifically nutrient lag time monitoring.	Defining the Landscape	5222013		USGS nutrient lag time monitoring			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
57 Soils	Explore use of USDA-NRCS (CEAP) soil data for slope and permeability.	Defining the Landscape	5222013		USDA-NRCS (CEAP) soil data			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
58 Soils	Identify and incorporate new soil and nutrient data for model.	Defining the Landscape	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
59 Soils	Better understand legacy P in soils.	Accounting for Swine	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
60 Soils	Consider soil P index, which affects P loss.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
61 Soils	In MD all plans are P-based, but not all plans are P-limited. Recommend finding out how many acres are P-limited.	Nutrient Placement and Usage	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
62 Soils	Use soil test data instead of university – P, K (o Nutrient Management Plans, AIR, soil labs)	Poultry Production and Nutrients	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			High
63 Yields	Replace crop need with actual yield data.	Measuring the Impacts of Dairy and Beef	5232013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
64 Yields	Obtain actual and expected yield from states' Nutrient Management Plans.	Nutrient Placement and Usage	5222013		Nutrient Management Plans	State Agencies		Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
65 Yields	Investigate elimination or modification of theoretical max nutrient uptake in favor of local crop yields.	Planting and Harvesting Crops	5222013					Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High
66 Yields	Replace statewide average yields with aggregated yield data from FSA individual farm records segmented by production systems.	Planting and Harvesting Crops	5222013		FSA			Agricultural Modeling Subcommittee (AMS)/Matt Johnston	May 22, 2013 - Proposed at BBBM Workshop			Medium - High

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