

AgWVG Ag Data Input Concerns

June 17, 2021

CAST-21 Workplan (Working Draft)

Approved data and method changes need to be finalized through the WQGIT by Sept. 1, 2021

Questions/
Comments?

KEY ACTION	STATUS
Task 1: Updates to data & methods that typically occur every 2 years. TODAY →	<ul style="list-style-type: none"> On-going CAST Data Update Frequency
Task 2: Investigate alternative forecasting methods for ag land uses & animals ✓	<ul style="list-style-type: none"> Nov 19 AgWG: CBPO presentation on 4 methods of forecasting Feb AgWG; See Mar AgWG decision
Task 3: Investigate 2012-2017 Ag Census change for fallow/idle acres ✓	<ul style="list-style-type: none"> AgWG Sept 17; NASS consulted; no new information; No further action; See Jan AgWG decision
Task 4: Investigate use of latest landcover & LiDAR imagery to better define changes in total ag (& other land use) acres ✓	<ul style="list-style-type: none"> Oct; Jan; Feb; Apr; New methodology approved, see May AgWG decision
Task 5: Investigate alternatives for double-crop acre estimates ✓	<ul style="list-style-type: none"> Oct 15 AgWG; NASS consulted- no new information; no recommended change to methodology, see May AgWG decision
Task 6: Consider supplemental NM for soybeans TODAY →	<ul style="list-style-type: none"> Dec/Jan/Mar/Apr Ad Hoc Updates Jan/Feb/Mar/Apr/May AgWG; Pending decision discussion June AgWG
Task 7: QA/QC'd historic & current layer pop. data for Hillandale Farms (PA)	<ul style="list-style-type: none"> In process Feb Ad Hoc- general discussion; data analysis pending
Task 8: Build-in Verification Ad Hoc Team products	<ul style="list-style-type: none"> In process; July AgWG Update

Reminder - CAST 21 Schedule:

- Sept 1, 2021 - All data and methods approved
- Nov 1, 2021 - CAST-21 Beta release
- Jan 1, 2022 - Final CAST-21 release

Task 4: Investigate use of latest landcover and LiDAR imagery to better define changes in total agriculture areas and crop acres through time as well as all other source categories in the developed sector, forest, mixed open, and wetlands

The AgWG supported adoption of the proposed land use methodology for determining the change in total agricultural area from 2013 to 2017.

Task 5: Investigate alternatives for estimating acres of double-crops and propose options for Partnership consideration

The AgWG approved the continued use of the current double-cropping methodology.

CBPO- NASS
annual dairy
surveys

Animal Data

Animal Populations: explore other estimating
options (MD/NY; Task 1)

AgWG June
Data Updates

Crop Production/Acres

Crop Production Acres: improve annual estimates
(MD; Task 1)

Nutrient Applications/Assumptions

Fertilizer Sales and Use Data (MD; Task 1)

MD Working w/
State Chemist

BMP Tracking & Reporting

Dairy Precision Feeding (PA)

TODAY June 17
2021 for Report
Back to the AgWG

BMP Effectiveness/Modeling

Winter Crop (NY/PA)

Manure Transport / Manure Treatment Technologies (PA)

Forthcoming
Discussions

Future Discussions with
Modeling Team (Phase 7)

Prioritizing Concerns (post CAST-21)

- AgWG Home Page
https://www.chesapeakebay.net/who/group/agriculture_workgroup

Projects and Resources

Agriculture Workgroup Chesapeake Assessment Scenario Tool (CAST) Issues Tracker

The below Chesapeake Assessment Scenario Tool (CAST) Issues Tracker records concerns that have been raised by jurisdictions in relation to agricultural data inputs. The tracker is a living document and will be updated regularly as progress is made on the issues or new issues are raised.

[CAST Issue Tracker 02.15.2021 \(15.21 KB\)](#)

Agriculture Workgroup Governance Protocol & Membership

[Governance Protocol \(Approved 3/15/18\) \(491.87 KB\)](#)

[AgWG At- Large Membership, Feb. 2021 \(88.47 KB\)](#)

[AgWG Signatory Membership, Mar 2021 \(35.1 KB\)](#)

Ad Hoc November Recommendation: Create a tracking mechanism for jurisdictions' wish list for 2-year CAST updates & the next model phase.

Improving Ag Data? (TASK 1)

Crop Acreage Data

Alternative methods to account for fitting Ag Census data to CBP needs?

- Adjusting methods for estimating crop acres (e.g. double crops)

Alternative/supplemental data sets

- Other data sets at the state or federal level?

Crop
Application
Goal

Animal Population Data

Additional NASS Annual Survey Data may be available to inform population trends between census years (incorporated every two years)

- Dairy, Beef Cattle, Layers, Swine...

Direct from industry data can inform animal population trends between census years.

- Requires careful cooperation
- Legal, privacy assurances

Manure Generated

Other Data Issues (new data incorporation every 2 years)

Soil P data

- Gary Shenk [Sept 2018 presentation](#) to AgWG on data set incorporated into the CBWM
- **Additional soil P data is welcome and encouraged (NY & WV have made inquiries)**

Manure Nutrient Concentration Data

- Changes in management may result in changes in nutrient concentrations
- **Additional manure concentration data is welcome and encouraged**

Fertilizer Data

- More accurate allocation of fertilizer within the CBW?
 - **Jurisdictions working with state chemists**

4. Define Inorganic Fertilizer
Available to Crops

CRITICAL CONCEPT:

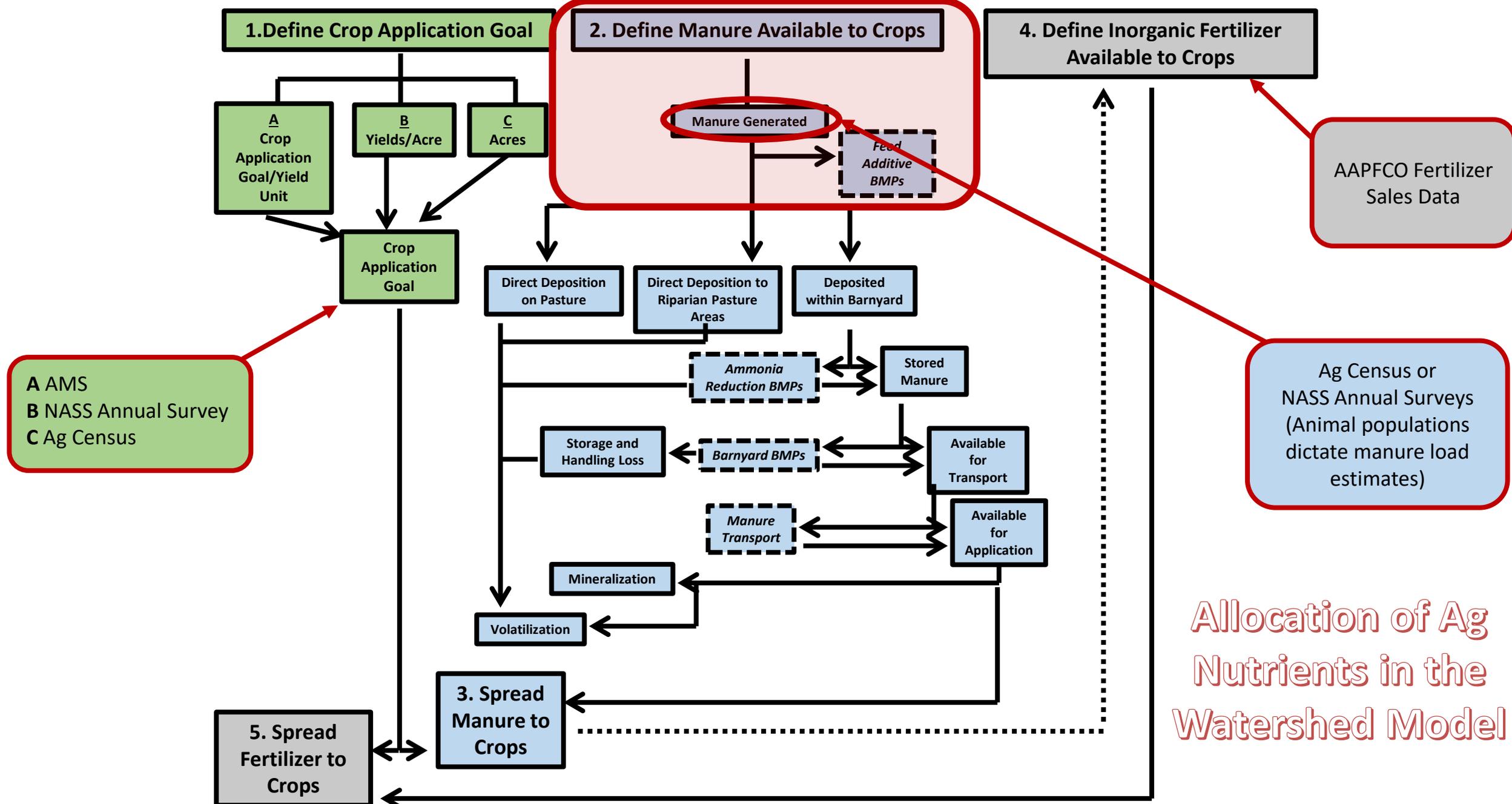
To maintain integrity of CBWM there are two options for new data sets:

- Provide data all the way back through 1985.

OR

- Use the trend in new data sets for the years available.

CBWM= Chesapeake Bay Watershed Model



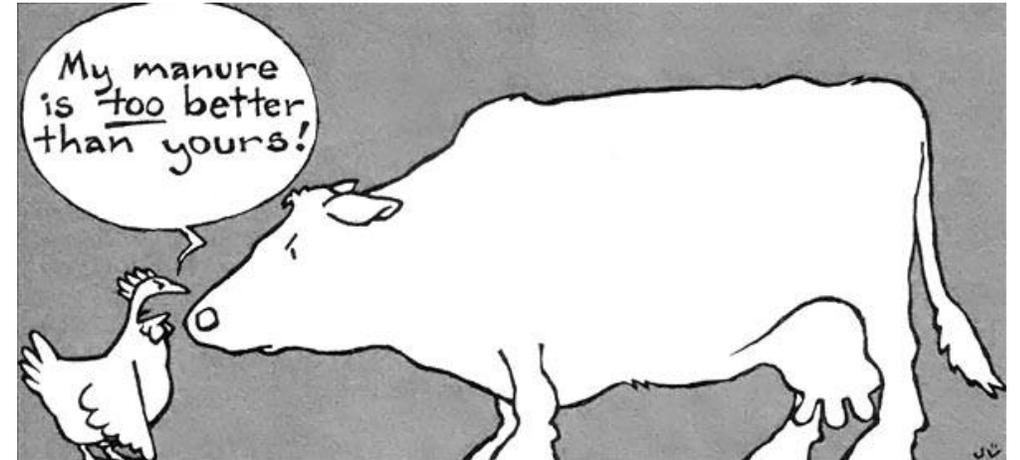
How Do We Use the 5-Year Ag Census Data?

- **Animal Inventory & Sales**

- Estimate Populations By County
- Define Feed Space Acres
- Estimate the “Manure Bucket” for the CBW
 - Manure nutrients applied to crops, directly deposited to pasture and riparian areas, and left in the feed space.

- **Crop Acres By County**

- Used in Conjunction with
 - High-Resolution Mapped Land Cover Data to Improve Land Use Assumptions
 - Yield Data & Crop Application Goals to Allocate Annual Fertilizer & Manure Applications Across the Watershed



<https://www.motheearthnews.com/homesteading-and-livestock/manure-fertilizer-zmaz83mazraw>

What About Annual Data?

National Agricultural Statistics Service (NASS) Annual Surveys

- Incorporated every two years (milestone)
 - When the watershed model “opens” for changes
- Yield data for the following major crops:
 - Alfalfa Hay; Barley; Buckwheat; Corn for Grain; Corn for Silage; Oats for Grain; Rye for Grain; Sorghum for Grain; Sorghum for Silage; Soybeans for Beans; and Wheat for Grain
- Broiler & Turkey Sales Data (state-level)

Animal Population Data (TASK 1)

NASS Annual Survey Data to Inform Population Trends Between Census Years

- Dairy, Beef Cattle, Layers, Swine...

Industry Data Can Inform Animal Population Trends Between Census Years.

- Requires careful cooperation
- Legal, privacy assurances, QA/QC

Population Distributions

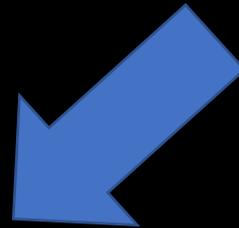
- Jurisdictions can provide data to allocate state totals to appropriate counties (contact CBPO staff for guidance)

Manure
Generated

CRITICAL CONCEPT:

To maintain integrity of CBWM there are two options for new data sets:

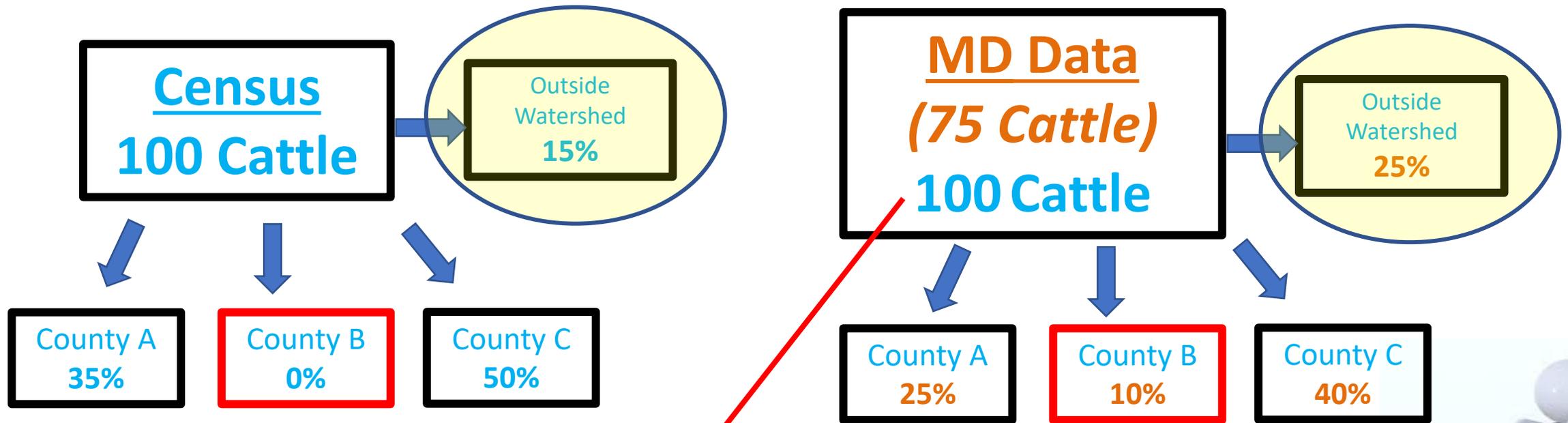
- Provide data all the way back through 1985.
- OR
- Use the trend in new data sets for the years available.



CRITICAL CONCEPT

Source for *distribution* of statewide populations can change.

Example: MD provides fraction of cattle in every county for the year 2020, and these fractions are used to distribute TOTAL statewide cattle populations from the Census of Agriculture.



Source of **TOTAL** statewide populations will not change for Phase 6 Watershed Model.



Manure Concentration Data(TASK 1)

Manure Generated

Manure Nutrient Concentration Data

- Changes in Management May Result in Changes in Nutrient Concentrations
- Additional Manure Concentration Data is Welcome and Encouraged (contact CBPO staff for guidance)
 - Swine
 - Broilers
 - Layers
 - Turkeys

CRITICAL CONCEPT:

To maintain integrity of CBWM there are two options for new data sets:

- Provide data all the way back through 1985.
OR
- Use the trend in new data sets for the years available.

Manure Generation – Nutrient Content

Manure
Generated

Data Currently Used in the Phase 6.0 Model

Animal Type	Manure Source	Lbs Dry Manure/Animal/Yr	Lbs TN/Lb Dry Manure	LbsTP/Lb Dry Manure
Beef	Use Beef - Cow (confinement) from ASAE* 2005 for manure values	5,475.00	0.028788	0.006467
Dairy	Use Lactating Cow, Dry Cow and Heifer from ASAE 2005 for manure values	4,404.33	0.042221	0.006764
Other Cattle	Estimated based upon weighted average combination of Beef and Dairy from Census of Agriculture	1,605.07	0.035504	0.006616
Horses	Use average of Horse- Sedentary and Horse - Intense Exercise from ASAE 2005 for manure values	3,102.50	0.031672	0.005941
Hogs for Breeding	Swine Characterization Report;	220.62	.294653	Varies
Hogs for Slaughter	Swine Characterization Report;	97.09	0.106841	Varies
Sheep and Lambs	Use ASAE 2003 for manure values	240.9	0.038182	0.007909
Goats	Use ASAE 2003 for manure values	680.91	0.034615	0.008462
Pullets	PLS Report; See Appendix A	12.95	Varies	Varies
Layers	PLS Report; See Appendix A	17.89	Varies	Varies
Broilers	PLS Report; See Appendix A	Varies	Varies	Varies
Turkeys	Turkey Characterization Report;	7.62	Varies	Varies

3-year trends (up or down) can be applied to existing values in this table.

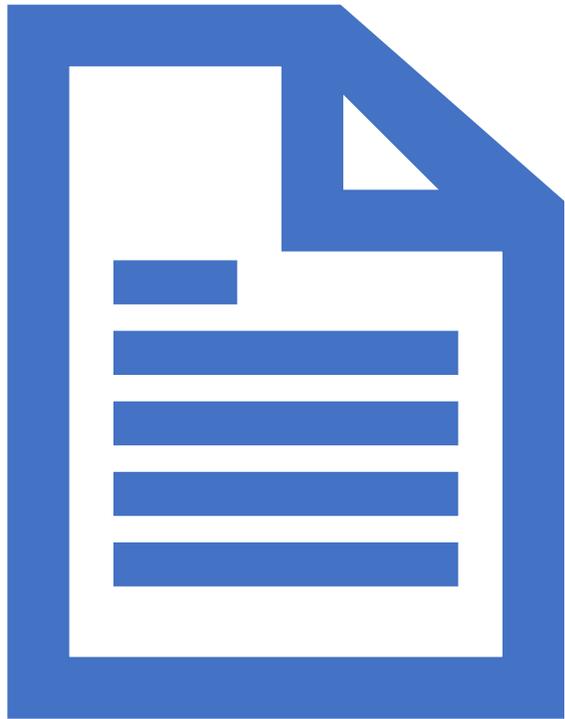
(requires 3 consecutive years of data)

Data must be collected in a similar fashion as was done for:

- [Poultry Litter Subcommittee Report](#)
- [Swine Characterization Study](#)
- [Turkey Characterization Study](#)

Available in [Section 3](#) of Model Documentation

*Now ASABE- American Society of Agricultural and Biological Engineers



Animal Data Collection Documentation

Poultry Litter Subcommittee APR 2015(page 20)

- The PLS established a clear process for collecting and summarizing laboratory analyses of poultry litter and litter production data. This process provided enough information to improve estimates of broiler, turkey and layer nutrient information. However, data gaps still exist, particularly for pullets and layers, and for turkey litter production estimates. The AMS recommends that all states begin regularly **reporting laboratory analyses of poultry litter and litter production data on a yearly basis** to the Chesapeake Bay Program. On a semi-regular basis (perhaps at the beginning of each Milestone period - 2 years - or more or less frequently), the **estimates for poultry litter nutrient production should be updated in the Watershed Model to represent how values have changed since the calibration of the new model**. These reported values should be used to update the key parameters in the basic equation: 1) mass of litter produced; 2) litter dry solids content; and 3) litter nutrient concentrations. Absent these values, the Partnership must rely on other widely published values such as those reported in the ASABE, 2005 report. Where possible, future data collection efforts should also focus on the correlation of these key parameters at the farm level, to quantify the effects and extent of various litter management scenarios. **A dataset for broilers, for example, might include for each record the volume of litter removed (including total cleanout and removal of crust between flocks) in a cleanout period, the number of flocks and number of birds produced during that cleanout period and their finish weight, and a manure analyses showing the N, P and moisture content of that litter. This would allow the states to determine the amount of N and P produced per bird on a farm level, which can then be aggregated into an average.**
- The AMS recommends that raw sample data for each parameter be submitted to the Bay Program using standardized templates. This would allow the Partnership to conduct more thorough statistical analyses of the data which in turn would result in better litter estimates for the modeling tools. **Ultimately, the Partnership will need to determine both the method and frequency of collecting and updating these values.** p 20

Turkey Litter Generation & Nutrient Content

6.0 Data Gaps and Needs

The team recommends that collection of data to characterize turkey litter generation and nutrient contents be continued in Virginia and expanded to other regions of the Bay watershed. All production systems and bird types should be identified in each state and common terminology developed to describe them. Establish an ongoing system to accept farm specific bird production data summarized to eliminate disclosure of confidential business information and used as the foundation for improving litter generation rate and nutrient concentration goals. (p.21)

Final Report for Turkey Litter Generation and Nutrient Content for use in Phase 6.0 Chesapeake Bay Program Watershed Model



Presented to the Agriculture Workgroup December 15, 2016

Swine Nutrient Generation

5.0 Data Gaps and Needs

The team recommends that collection of data to characterize swine manure generation and nutrient contents be continued in Pennsylvania and Virginia and expanded to other integrator companies and regions of the Bay watershed. All production systems and animal types should be identified in each state and common terminology developed to describe them. An ongoing system to accept farm specific production data should be established. Summarized data should be collected in a manner that eliminates disclosure of confidential business information. This data can be used as the foundation for improving manure generation rate and nutrient concentration goals.

Recommendations to Estimate Swine Nutrient Generation in the Phase 6 Chesapeake Bay Program Watershed Model



FINAL REPORT

Recommendations for Approval by the Water Quality Goal Implementation Team's Agriculture Workgroup

Submitted by the Commercial Swine Characterization Project Team

Submitted to:
Agriculture Workgroup
Chesapeake Bay Program

December 18, 2016

Chesapeake Bay Program Grant Guidance

[Attachment 6](#): Wastewater Facility and BMP Implementation Data Submission Specifications and Requirements (page 6)

Non-point source data are collected for the following purposes:

- 1) To assess existing and new BMP projects through the reporting of implementation, inspection, maintenance, and retirement dates.
- 2) Update annual estimates of construction and harvested forest acres through the reporting of permitted, disturbed acres for each category – including estimates of any unpermitted acres.
- 3) Update model estimates of permitted animals and manure nutrient concentrations for poultry and swine every two years for use in the next milestone period.

Chesapeake Bay Program Grant Guidance

Attachment 6: Wastewater Facility and BMP Implementation Data Submission Specifications and Requirements (page 11)

Reporting Animal Information:

Animal data will be updated in the Phase 6 Watershed Model **every two years.**

- Reporting of permitted and unpermitted animals
 - Jurisdictions should provide the fraction of animal type by county that is considered “permitted” either through an EPA or state program. These data will be used to update the land use acres for permitted feeding operations and unpermitted feeding operations once every two years.
- Reporting of animal manure nutrient concentrations for poultry and swine
 - Data should be provided for the last three years, if possible, and updated each year to reflect new litter/manure samples. Jurisdictions who don’t report volume data will receive default values according to rules established by the CBP Agriculture Workgroup. These data will be reviewed by the Partnership for use in estimating manure nutrients once every two years.

Chesapeake Bay Program Grant Guidance

[Attachment 6](#): Wastewater Facility and BMP Implementation Data Submission Specifications and Requirements (page 11-12)

BMP IMPLEMENTATION REPORTING FREQUENCY:

Annual progress reporting of wastewater data and non-wastewater BMPs are an output of CBPO grants. Grant recipients are expected to provide CBPO with complete, quality-assured data in the proper formats. This will enable CBPO to begin immediate processing as a CBP Partnership Chesapeake Bay Watershed Model annual progress scenario. It is expected that the following schedule and deadlines are followed:

August 31 – Data submissions and descriptions due for:

- CAFO/AFO animal splits by county
- nutrient concentrations in manure for poultry and swine



July AgWG

- Update on BMP Verification Ad Hoc Action Team discussion
- Toxics Workgroup BMP co-benefits discussion
- Hillandale (CAST-21 Workplan Task 7) update

July AgWG CAST Concerns Ad Hoc

- Winter BMP discussion

August/September AgWG

- Prioritizing needs for Phase 7 Watershed Model