Pennsylvania Chesapeake Bay Watershed 2016 Farmers Survey Results

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2016 Pennsylvania Chesapeake Bay Watershed Farmers Survey

Introductions

Neil Shader, Press Secretary, DEP (Moderator)

Patrick McDonnell, Acting Secretary, DEP

Russell Redding, Secretary, Pennsylvania Department of Agriculture

Matt Royer, Director, Agriculture and Environment Center, Penn State

Jim Shortle, Distinguished Professor of Agricultural and Environmental Economics, Penn State

Rich Batiuk, Associate Director for Science, Analysis and Implementation, U.S. Environmental Protection Agency, Chesapeake Bay Program Office

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2016 Pennsylvania Chesapeake Bay Watershed Farmers Survey

Agenda

1. **Remarks – Patrick McDonnell**, DEP Acting Secretary

2. **Remarks – Russell Redding**, Secretary, Department of Agriculture

3. **Survey discussion – Matt Royer**, Director of Agriculture and Environment Center, and **Jim Shortle**, Distinguished Professor of Agricultural and Environmental Economics, Penn State

4. **Implications for Bay Watershed – Rich Batiuk**, Associate Director for Science, Analysis and Implementation, U.S. Environmental Protection Agency, Chesapeake Bay Program Office

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2016 Pennsylvania Chesapeake Bay Watershed Farmers Survey

Locating, quantifying, and verifying best management practices that farmers voluntarily implement to reduce the nitrogen, phosphorous, and sediment entering our local streams and rivers, and ultimately the bay.

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2016 Pennsylvania Chesapeake Bay Watershed Farmers Survey

Why Results Are Important:

- They show that farmers are doing water quality protection work that has been unaccounted for.

- Having accurate data is essential to optimizing use of resources to
  – Meet goals of Governor Wolf's Bay Restoration Strategy
  – Develop Phase 3 Watershed Implementation Plan

- Survey protocol is replicable for future use.

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2016 Pennsylvania Chesapeake Bay Watershed Farmers Survey

Thank You

- Pennsylvania Department of Environmental Protection
- Stakeholders
  - Pennsylvania Farm Bureau
  - PennAg Industries
  - Professional Dairy Managers of Pennsylvania
  - Pennsylvania State Conservation Commission
  - Pennsylvania Association of Conservation Districts
  - Penn State Extension
  - Environmental Protection Agency
- Penn State College of Agricultural Sciences
  - Dean Roush
  - Dr. Jim Shortle
  - Matthew Royer

2016 Pennsylvania Chesapeake Bay Watershed Farmers Survey

Key Points

- Positive experience/outcome

- Important part of Pennsylvania's Chesapeake Bay restoration strategy

- Follows through on promise

- Allows for a more meaningful conversation about farm plans and conservation practices

- Provides the basis for including results in metrics

- Land, water quality, and communities are the beneficiaries

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Survey Overview:
Conservation Practices

Questions about 11 conservation practices or plans:

Nutrient/Manure Mgmt Plans	No Till
Enhanced Nitrogen Mgmt	Cover Crops
Manure Transport	Stream Bank Fencing
Animal Waste Storage Systems	Riparian Buffers
Barnyard Runoff Controls	Land Retirement
Ag E&S Plans/Conservation Plans	

These are priority practices that achieve high levels of nutrient and sediment reductions, may have high instances of volunteer implementation, and are accepted into Bay model

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Survey Administration

Administered by Penn State Survey Research Center

- Web and mail options
- Ran January 29–April 30, 2016

6,787 survey returns
35% response rate
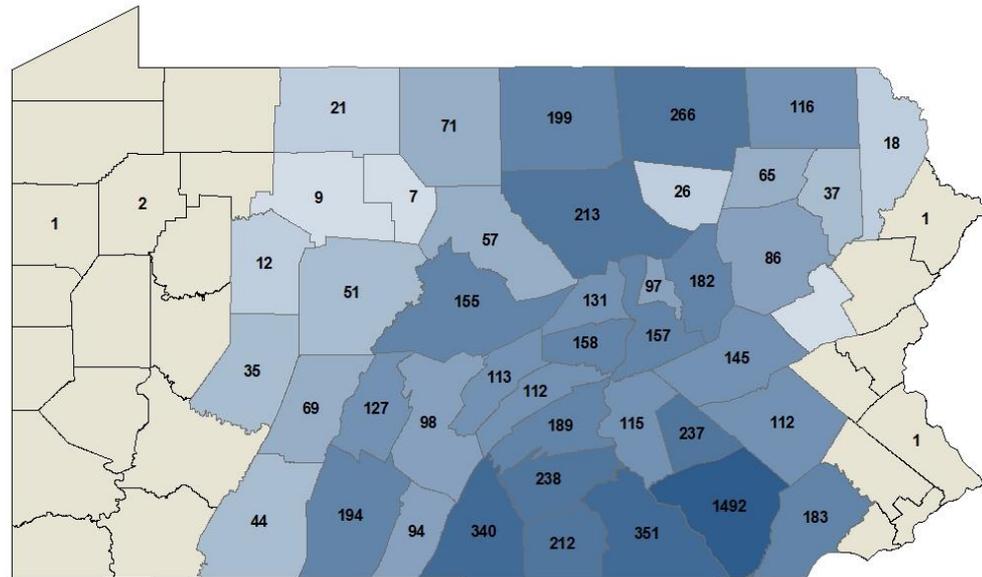
Analyzing Results: Verification Process

- 10% randomly selected for farm visits by Penn State Cooperative Extension to assess inventory results and help researchers analyze data

- Extension staff trained in July; conducted farm visits August–September 2016

- 42 Extension agents typically trained in agronomy, horticulture, nutrient management, livestock systems with master's degree or higher

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Analyzing Results: Reporting BMPs

- Cumulative results (by county) provided to DEP to document conservation practices implemented to be reported to Chesapeake Bay Program

- Care taken to avoid "double counting"
  - Practices receiving government cost share not reported
  - Practices already captured through regulatory programs not reported (Act 38 plans)
  - Practices for which DEP using other data collection methods not reported (i.e., no till, cover crops)

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Statistical Analysis

- Subsample of farm visit data compared to survey returns for the following BMPs:

Nutrient/Manure Mgt Plans	Ag E&S Plans
Enhanced Nutrient Management	Conservation Plans
Animal Waste Storage Systems	Stream Bank Fencing
Barnyard Runoff Controls	Riparian Buffers

- For all these BMPs, adequate sample sizes existed to develop statistically acceptable results
- Manure transport not statistically analyzed – small sample size

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Statistical Analysis

- Survey responses were compared to farm visit reports.

- Analysis was completed separately for each BMP.

- For all BMPs except riparian buffers, statistical analysis revealed accuracy in the data reported by farmers, with a trend toward under-reporting.

- Riparian buffers were systematically over-reported (numbers adjusted to reflect this).
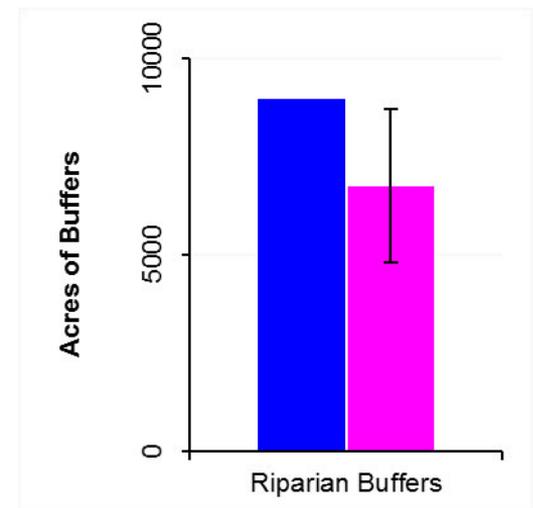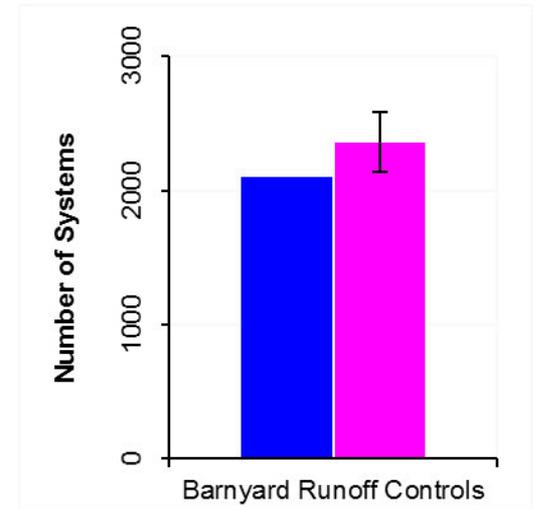
Survey Results

Practice	Amount Implemented			
NMPs/MMPs*	335,250 ac row crops	37,243 ac pasture	103,307 ac hay	
Enhanced Nutrient Management	97,562 acres			
Manure Storages	1,598 dairy storages	194 beef storages	213 swine storages	159 poultry storages
Barnyard Runoff Controls	2,106 systems			
Agricultural E&S Plans	40,170 ac row crops	4,930 ac pasture	9,973 ac hay	
Conservation Plans	173,481 ac row crops	17,239 ac pasture	37,544 ac hay	
Stream Bank Fencing	1.34 million linear ft			
Grass Riparian Buffers	1,757 acres			
Forest Riparian Buffers	5,808 acres			

*Includes only non-cost-shared NMPs. NMPs still need to be separated from MMPs for reporting purposes.

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Strengthening verification of best management practices implemented in the Chesapeake Bay Watershed: A basinwide framework

# Partnership Models Used to Support Collaborative Decision Making

Chesapeake Bay Airshed
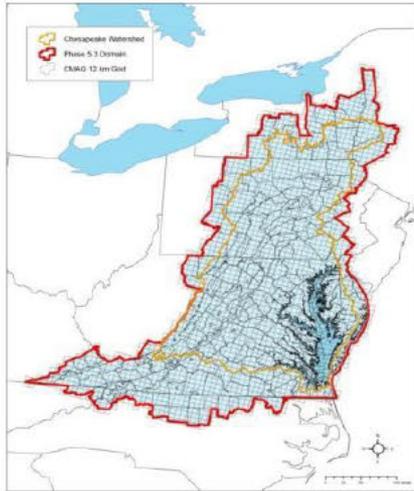
Chesapeake Bay Land Change

Chesapeake Bay Scenario Builder

Inputs
- BMP Type and location (NEIEN/State supplied)
- Land acres
- Remote Sensing, NASS Crop land Data layer
- Crop acres
- Yield
- Animal Numbers (Ag Census or state supplied)
- Land applied biosolids
- Septic system (#s)

Parameters (Changeable by user)
- BMP types and efficiencies
- Land use change (BMPs, others)
- RUSLE2 Data: % Leaf area and residue cover
- Plant and Harvest dates
- Best potential yield
- Animal factors (weight, phytase feed, manure amount and composition)
- Crop application rates and timing
- Plant nutrient uptake
- Time in pasture
- Storage loss
- Volatilization
- Animal manure to crops
- N fixation
- Septic delivery factors

Outputs
- BMPs, # and location
- Land use
- % Bare soil, available to erode
- Nutrient uptake
- Manure and chemical fertilizer (lb/segment)
- N fixation (lb/segment)
- Septic loads

Chesapeake Bay Watershed

Chesapeake Bay Water Quality and Sediment Transport
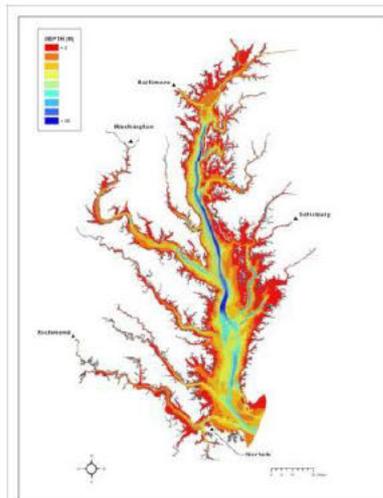
Chesapeake Bay Filter Feeder

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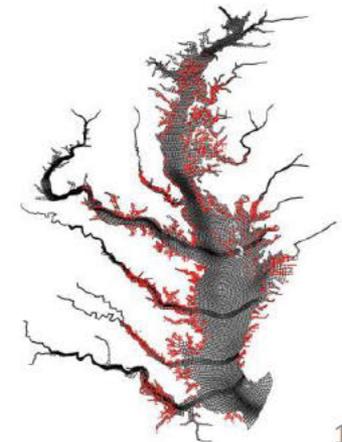
Reporting BMPs: Key to Accounting for Progress
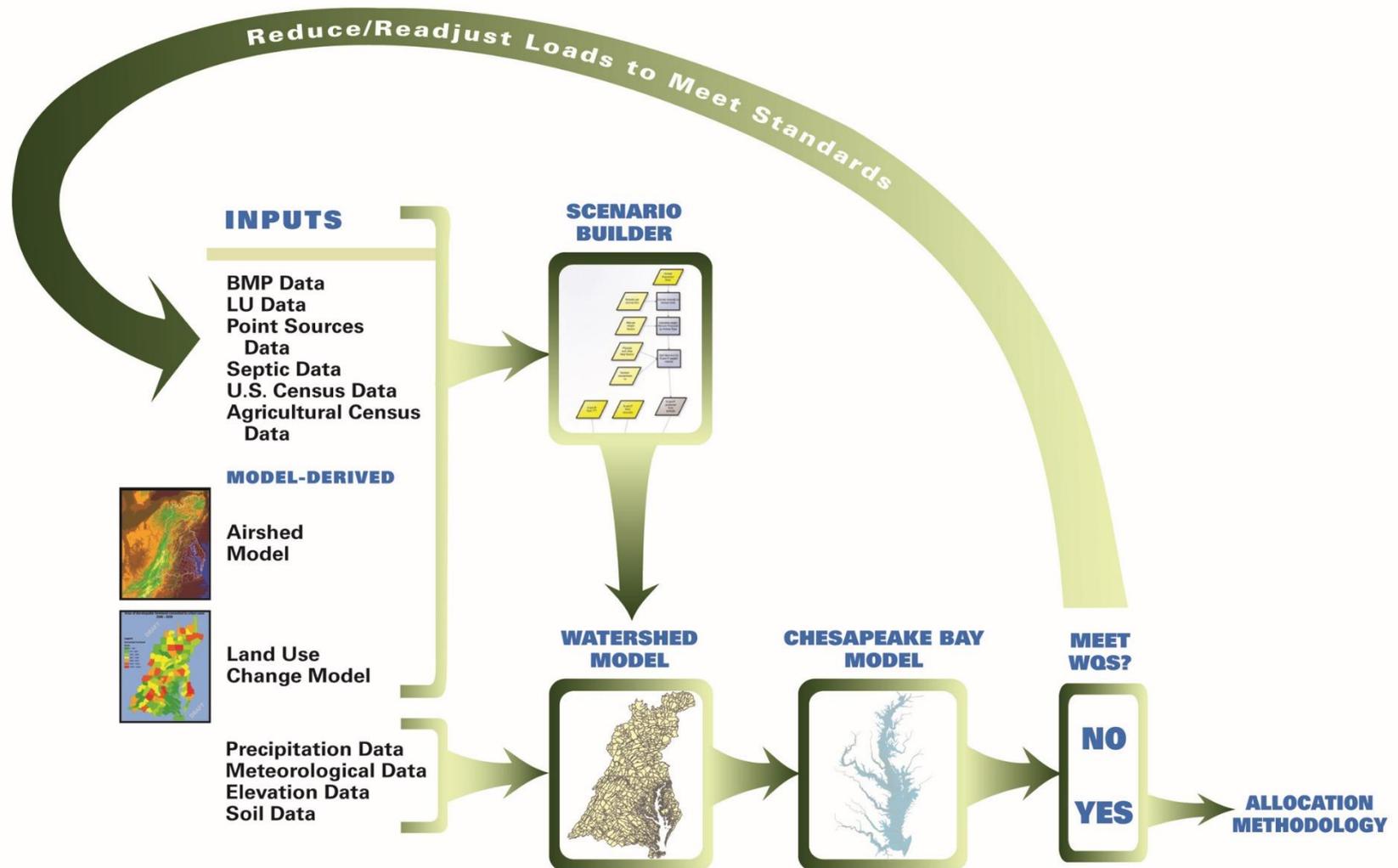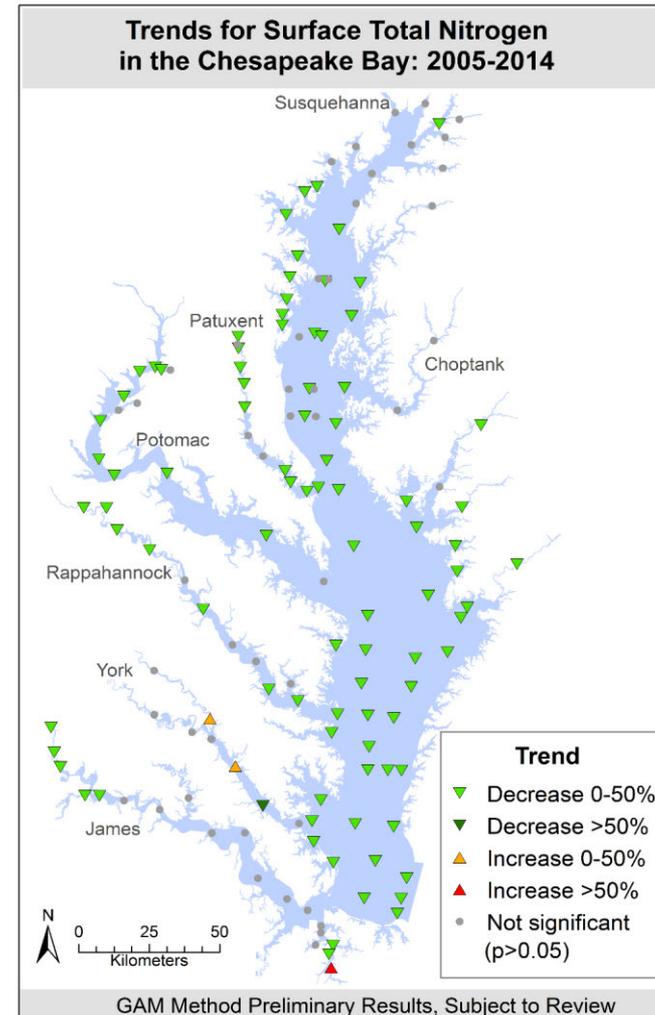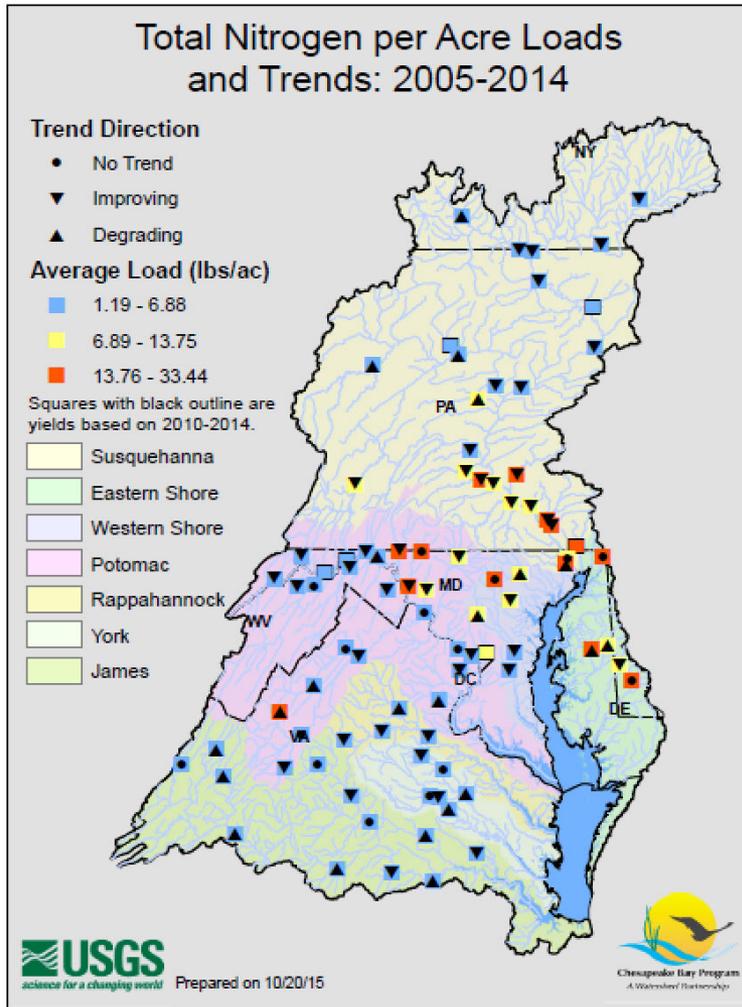
Reduce/Readjust Loads to Meet Standards

INPUTS

BMP Data
LU Data
Point Sources Data
Septic Data
U.S. Census Data
Agricultural Census Data

MODEL-DERIVED

Airshed Model

Land Use Change Model

Precipitation Data
Meteorological Data
Elevation Data
Soil Data

SCENARIO BUILDER

WATERSHED MODEL

CHESAPEAKE BAY MODEL

MEET WQS?

NO

YES

ALLOCATION METHODOLOGY

Trends: Nitrogen Loads

Questions?

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Tom Wolf, Governor   Patrick McDonnell, Acting Secretary