

Relative Load Reductions of BMPs Described in the Phase II Watershed Implementation Plans
Analysis conducted by Chesapeake Bay Program Scenario Builder Team and Watershed Model Team
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Objective

The Chesapeake Bay Program's Verification Committee requested an analysis of BMPs described within each jurisdiction's Phase II Watershed Implementation Plan (WIP). Specifically, the Verification Committee wished to identify the most commonly applied BMPs in each state, as well as the BMPs that contributed the greatest reductions in nutrient pollution delivered to the Chesapeake Bay. This information could be used to allow jurisdictions and the Chesapeake Bay Program Partnership to focus verification efforts on a subset of BMPs.

Methods

Chesapeake Bay Program staff analyzed the relative nutrient reductions of each BMP described in the Phase II WIPs by isolating each BMP in a single Watershed Model and/or Scenario Builder run. Each isolated run was compared to a "NO ACTION" scenario in which none of the BMPs were present. The Phase II WIP was also compared to a "NO ACTION" scenario to determine nutrient reductions from this condition. These isolated BMP reductions were then compared to the overall reductions called for in the Phase II WIPs to determine a percent reduction for each nutrient type. An example of this process is explained below:

Hypothetical example:

State X's Phase II WIP resulted in a **2,000,000 lb reduction of nitrogen delivered** to the Chesapeake Bay from the NO ACTION scenario.

State X's Phase II WIP called for the implementation of **100,000 acres of soil and water quality conservation plans**.

After accounting for interactions between BMPs, the isolation scenario for soil and water quality conservation plans showed a **total reduction of 100,000 lbs of nitrogen delivered** to the Chesapeake Bay from the NO ACTION scenario.

This reduction represented **5 percent of the total reductions** called for in the Phase II WIP.

Disclaimer

The Chesapeake Bay Program modeling tools were established to test how the unique combination of BMPs called for in management scenarios such as the Phase II WIP would reduce loads to the Chesapeake Bay. Inherent in this type of test are unique interactions between BMPs, land uses and inputs to the watersheds. For these reasons, the results of this analysis are unique to this single scenario. If changes were made to land uses, inputs or the BMPs, a new analysis would be needed to accurately describe the resulting load reductions.

Acres of BMPs Described in Phase II WIPs

BMP	Acres
Conservation Plans	6,811,304
Enhanced Nutrient Application Management	2,082,419
Other Conservation-Till	2,002,283
Decision Agriculture	1,143,587
Cover Crop	1,136,034
Nutrient Application Management on Pasture	1,033,992
Nutrient Application Management on Crop	995,989
Prescribed Grazing	948,389
Land Retirement	609,407
Liquid & Poultry Injection	371,823
Continuous NoTill	321,901
Commodity Cover Crop	307,143
Precision Intensive Rotational Grazing	286,210
Forest Buffers	277,913
Crop Irrigation Management	251,767
Grass Buffers	243,762
Tree Planting	210,443
Forest Harvesting BMPs	164,821
Pasture Alternative Watering	141,313
Wetland Restoration	106,019
Carbon Sequestration	101,892
Stream Access Control with Fencing	98,821
Grass Buffers on Fenced Pasture Corridor	44,135
Horse Pasture Management	30,617
Water Control Structures	28,496
Forest Buffers on Fenced Pasture Corridor	27,073
Conservation-Till Specialty Crops	25,012
Barnyard Runoff Control	13,846
Capture & Reuse	7,277
Ditch Filters	5,129
Loafing Lot Management	501

Units of BMPs Described in Phase II WIPs

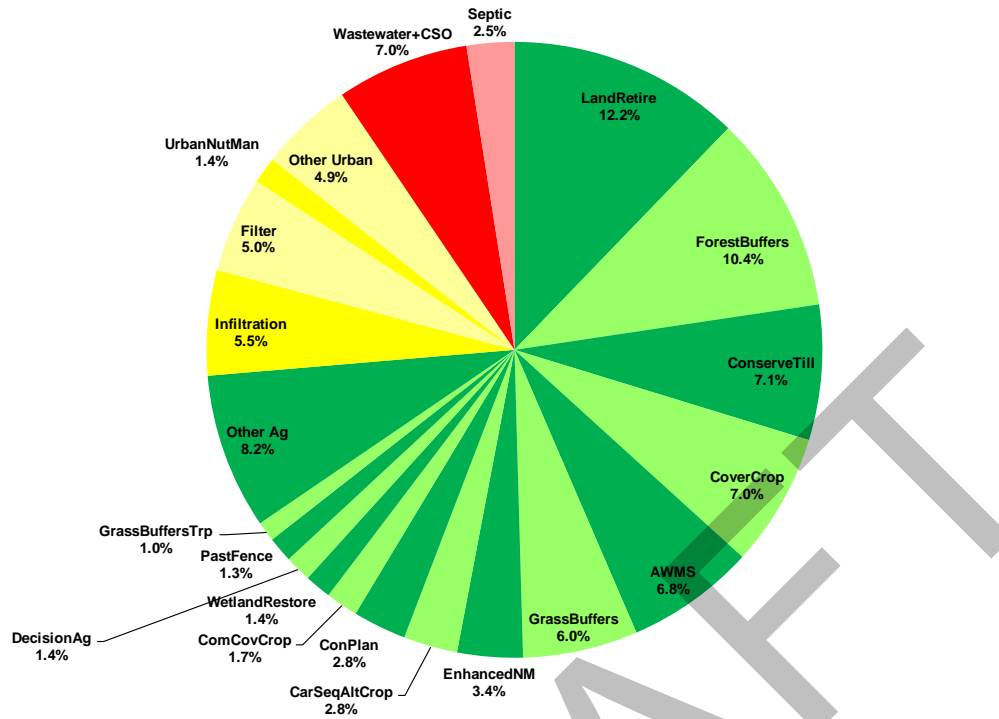
BMP	Measurement	Units
Dirt&Gravel Road E&S (feet)	feet	28,929,712
Urban Stream Restoration (feet)	feet	2,332,664
NonUrban Stream Restoration	feet	1,128,757
Manure Transport Outside CBWS	tons	572,999
Street Sweeping (lbs)	lbs	9,628,448
Livestock+Poultry Waste Management Systems	AU	2,772,306
Livestock+Poultry Mortality Composting	AU	71,664
Septic Denitrification	systems	266,978
Septic Connections	systems	232,085
Septic Pumping	systems	141,963

The acres and units reported in the above tables represent the aggregate of all BMPs credited from the states' Phase II WIPs. As you will see in the relative reduction charts below, greater acres or units do not necessarily translate to greater relative reductions in nitrogen, phosphorus or sediment. This is because each BMP affects nitrogen, phosphorus and sediment reaching the Chesapeake Bay in a unique way.

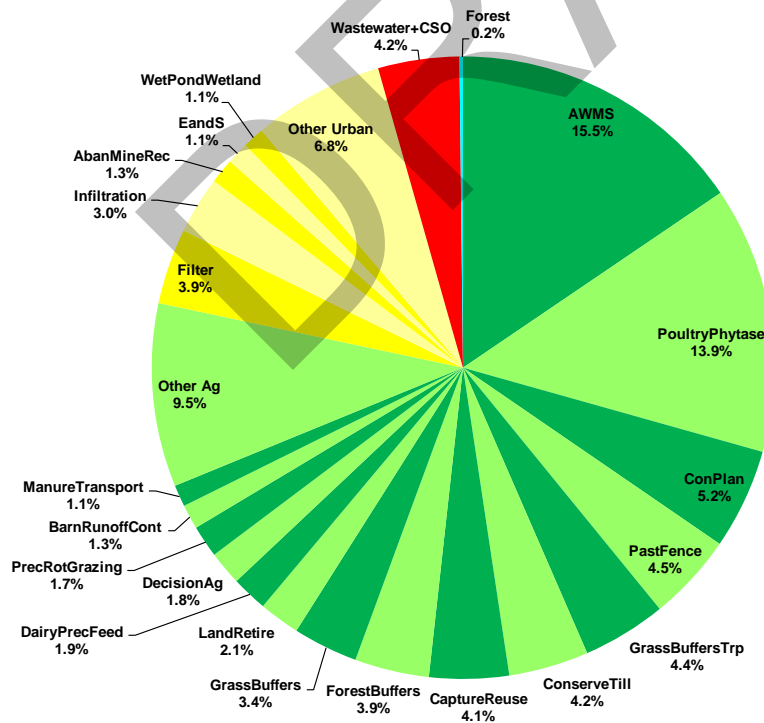
Results

The charts below show the relative nitrogen, phosphorus and sediment reductions of BMPs compared to the overall Phase II WIP reductions. From these charts, we can clearly see that **Land Retirement** contributed the most reductions for nitrogen in this analysis, while **Animal Waste Management Systems** contributed the most reductions for phosphorus, and Conservation Tillage contributed the most reductions for sediment.

Relative Nitrogen Reductions Across the Chesapeake Bay Watershed as Described in Phase II WIPs



Relative Phosphorus Reductions Across the Chesapeake Bay Watershed as Described in Phase II WIPs



Relative Sediment Reductions Across the Chesapeake Bay Watershed as Described in Phase II WIPs

