



Opening doors

FOR

MARYLAND'S
CONSERVATION
FARMERS

MACS 2016 ANNUAL REPORT

Maryland Agricultural Water Quality Cost-Share Program



OPENING DOORS

For more than 30 years, the Maryland Agricultural Water Quality Cost-Share Program (MACS) has been opening doors for farmers who want to install proven conservation measures on their farms to protect and enhance natural resources, safeguard water quality for downstream neighbors, minimize livestock impacts on the environment, and prevent nutrients and sediment from reaching the Chesapeake Bay and its tributaries.

During the year, MACS provided Maryland farmers with \$33.5 million in conservation cost-share grants, the largest grant allocation in our program's history.

So how was the money spent? The majority of the funding—approximately \$24.5 million—supported our popular cover crop program, which is widely regarded as one of the most cost-effective ways to keep soil and nutrients out of the Bay and its tributaries. While larger states in the Bay watershed struggle to plant a fraction of the amount of cover crops grown here in Maryland, our state enjoyed the largest cover crop planting ever, with more than half a million acres of small grains planted.

Special programs like our Manure Transport Program experienced record growth as farmers work to comply with new environmental rules restricting the use of manure on fields with high soil phosphorus levels. During the year, MACS helped farmers transport 213,000 tons of manure to other farms or alternative use facilities that could use the product safely, up from 167,000 tons transported last year. Twenty-five percent of this tonnage was trucked out of the Bay watershed.

Our capital program, however, continues to provide farmers with solutions to the wide range of unique natural resource challenges that individual operations face. With guidance and technical assistance from local soil conservation districts, farmers across the state use MACS grants to protect and restore the health of Maryland's waterways one farmstead, crop field, and pasture at a time. When the owner of a 125-acre beef and crop operation in Cecil County wanted to install 5,000 feet of fencing to keep livestock out of a stream, MACS was there. In Carroll County, when a dairy farm wanted to install a waste storage structure to protect and recycle manure resources, MACS provided needed cost-share funds. And on Maryland's Eastern Shore, when a crop and poultry farmer wanted to install heavy use pads at the entrances to his poultry houses to protect groundwater resources from manure spills, MACS helped make it possible.

When you add it all together, MACS helped Maryland farmers install more than 2,600 conservation projects on their farms last year. Collectively, these projects will help prevent more than 3 million pounds of nitrogen, 121,000 pounds of phosphorus, and 20,000 tons of soil from entering our state's waterways.

In a very real sense, the conservation practices that we finance not only contribute to healthy waterways, they contribute to Maryland's extraordinary rural beauty in the form of well managed farms and well cared for natural resources. Here in Maryland, we want farmers to know that the door to better conservation is always open. Please read on to learn more about our accomplishments in Fiscal Year 2016.

A handwritten signature in black ink that reads "Joe Bartenfelder". The signature is written in a cursive, flowing style.

Joe Bartenfelder, Maryland Agriculture Secretary

Mission Chesapeake

The Maryland Agricultural Water Quality Cost-Share Program helps farmers finance water quality improvement projects on their farms, invest in sustainable agricultural practices, and comply with federal, state, and local environmental requirements.

Since 1984, the program has provided thousands of farmers with conservation grants that cover up to 87.5 percent of the cost to install 30 eligible best management practices on farms to prevent soil erosion, manage crop nutrients, and protect water quality downstream. A low-interest loan program provides up-front funds to help farmers jump start major improvement projects or purchase needed conservation equipment.

The cost-share program is a key feature of Maryland's Watershed Implementation Plan to restore clean water in the Chesapeake Bay and the state's creeks, streams, and rivers by 2025. The program is delivered by the state's 24 soil conservation districts with technical guidance from USDA's Natural Resources Conservation Service. Grants are used to help farmers install conservation practices on their farms that meet the clean water goals of the Chesapeake Bay Total Maximum Daily Load (TMDL).

Chesapeake Bay Clean-Up

Progress Through June 2016*

MILESTONE	Annual Goal (Due June 30, 2016)	Status As of June 30, 2016	Percent of Annual Goal Achieved
Cover Crops	Plant 417,014 acres of cover crops each year	501,204 acres planted during 2015-2016 planting season	121%
Manure Transport	Annually transport 51,000 tons of poultry litter or livestock manure to farms or alternative use facilities that can use the manure safely and in accordance with nutrient management plans	213,151 tons of manure transported in 2016	418%
MILESTONE	2017 Midpoint Assessment Goal (Due June 30, 2017)	Status As of June 30, 2016	Percent of 2017 Midpoint Assessment Goal Achieved
Soil Conservation and Water Quality Plans	Develop plans for 1,026,413 acres	923,147 acres planned	90%
Retirement of Highly Erodible Land	Retire 2,554 acres of highly erodible land by 2017	8,303 acres retired and planted with protective vegetation	325%
Streamside Forest Buffers	Plant 927 acres of forest buffers next to streams by 2017	1,535 acres planted	166%
Streamside Grass Buffers	Plant 2,273 acres of grass buffers next to streams by 2017	4,824 acres planted	212%
Waste Storage Structures/Livestock	Construct 144 livestock waste storage structures by 2017	340 structures installed	236%
Waste Storage Structures/Poultry	Construct 31 poultry waste storage structures by 2017	119 structures installed	384%

*In some instances, progress includes practices installed with funds from both MACS and USDA's Natural Resources Conservation Service.

2016 FUNDING SUMMARY

In Fiscal Year 2016, the Maryland Agricultural Water Quality Cost-Share Program provided Maryland farmers with \$33.5 million in grants to install 2,620 conservation projects on their farms that control soil erosion, reduce nutrient runoff, and protect water quality in streams, rivers, and the Chesapeake Bay. The figure represents the largest annual funding allocation in the program's history and the sixth consecutive year of growth. Farmers who received these cost-share grants invested about \$1.5 million of their own money into projects that will prevent an estimated 3 million pounds of nitrogen and 121,132 pounds of phosphorus from entering Maryland waterways. Cover crops were responsible for the bulk of the nitrogen and phosphorus savings. In addition, the projects will prevent an estimated 20,236 tons of soil from impacting local streams.

A LIVESTOCK CROSSING INSTALLED AT A BEEF OPERATION IN CARROLL COUNTY HELPS PROTECT A LOCAL STREAM FROM LIVESTOCK IMPACTS.



Program Summary Fiscal Year 2016

CAPITAL PROJECTS	Number of Projects	Funds
Total Approved from State Funds	561	\$11,643,404
Capital Projects Completed		
CREP Projects with State Funds	78	\$359,345
All Other Projects with State Funds	478	\$7,015,866
With Federal Funds	16	\$115,410
Total Capital Projects Completed	572	\$7,490,621
Special Projects Completed		
Cover Crops	1,678	\$24,583,543
Manure Transport ¹	275	\$954,300
Manure Injection and Incorporation	95	\$479,101
Total Special Projects Completed	2,048	\$26,016,944
Total Capital and Special Projects Completed	2,620	\$33,507,565²
ENVIRONMENTAL BENEFITS		
	Nitrogen	Phosphorus
Estimated Pounds of Nutrients Removed by Capital Projects	92,777	21,082
Estimated Pounds of Nutrients Removed by Cover Crops	3,001,230	100,050
	Tons	Acres of Land
Tons of Soil Saved Per Year ³	20,236	1,218
Manure Managed Daily with Animal Waste Storage Structures		
	Tons of Manure	Animal Units⁴
Poultry Manure Managed Daily	645	42,321
Dairy Manure Managed Daily	408	8,853
Beef Manure Managed Daily	174	4,969
Other Animal Manure Managed Daily	37	448
Total Animal Manure Managed Daily	1,264	56,591

¹Does not include poultry company matching funds (\$447,882)

²Includes approximately \$14 million in special funds from the Chesapeake and Atlantic Coastal Bays Trust Fund

³Based on the Revised Universal Soil Loss Equation (RUSLE)

⁴One animal unit = 1,000 lbs. of live animal weight

Note: Nutrient reduction figures are based on the best information available and are consistent with the Chesapeake Bay Model.



A CONCRETE PAD CONSTRUCTED AT THE ENTRANCE TO A POULTRY HOUSE IN QUEEN ANNE'S COUNTY HELPS PROTECT GROUNDWATER AND SURFACE WATER DURING CLEANOUTS.

CAPITAL PROJECTS

Most of the best management practices funded by the Maryland Agricultural Water Quality Cost-Share Program are financed through the capital program by the sale of general obligation bonds. In Fiscal Year 2016, the program provided farmers with \$7.37 million to install 556 conservation projects on their farms to protect soil and water resources. These projects featured best management practices described on pages 6 and 7, including stream protection practices installed on land enrolled in the Conservation Reserve Enhancement Program (CREP). Grassed waterways, heavy use area protection practices, waste storage structures, livestock fencing, riparian forest buffers, grade stabilization structures, roof runoff structures, animal mortality facilities, watering facilities, and stream crossings round out the top ten practices financed by the capital program in Fiscal Year 2016.

Soil Conservation District Summary For Capital Projects Fiscal Year 2016

DISTRICT	Completed Projects	MACS Payment
Allegany	8	\$42,896
Anne Arundel	2	\$44,540
Baltimore County	24	\$269,261
Calvert	2	\$24,791
Caroline	17	\$460,193
Carroll	131	\$1,699,049
Catoctin	23	\$177,980
Cecil	5	\$141,994
Charles	1	\$3,034
Dorchester	15	\$189,994
Frederick	34	\$344,208
Garrett	2	\$4,365
Harford	24	\$228,758
Howard	14	\$111,410
Kent	52	\$470,291
Montgomery	6	\$77,242
Prince George's	7	\$71,066
Queen Anne's	33	\$426,437
St. Mary's	14	\$82,937
Somerset	10	\$463,848
Talbot	10	\$192,526
Washington County	38	\$803,222
Wicomico	15	\$489,650
Worcester	7	\$311,584
TOTAL	494	\$7,131,276

Completed MACS Cost-Shared Practices by District for Fiscal Year 2016

PRACTICE	Allegany	Anne Arundel	Baltimore County	Calvert	Caroline	Carroll	Catoctin	Cecil	Charles	Dorchester	Frederick
Conservation Cover						8	2				2
Contour Farming											
Contour Orchard											
Critical Area Planting		1	4	1			1				
Animal Mortality Facility					3					2	
Diversion			1								
Fencing	2		2	1		13	6				7
Field Border											
Filter Strip						1	1				1
Forage and Biomass Planting						1					
Vegetated Treatment Area											
Grade Stabilization Structure					1		1			1	
Grassed Waterway			12			49	5	2			7
Heavy Use Area Protection		1			10	11	1	1		6	5
Lined Waterway or Outlet				1				2			
Livestock Pipeline											
Riparian Forest Buffer	3					16	1				6
Riparian Herbaceous Cover					1					6	
Roofs and Covers						7	1				1
Roof Runoff Structure	1		1			7	1	2	1		1
Sediment Basin											
Sediment Control Pond				1							
Spring Development	1		4								
Stream Crossing			2			12	5				1
Strip Cropping, Contour											
Strip Cropping, Field											
Terrace System											
Waste Storage Structure		1			2	16	1	1		2	4
Waste Treatment Lagoon											
Wastewater Treatment Strip											
Water Control Structure					1						
Water Well											1
Watering Facility	3		5			3	1				3
Wetland Restoration											
TOTAL	10	3	31	4	18	144	27	8	1	17	39

Garrett	Harford	Howard	Kent	Montgomery	Prince George's	Queen Anne's	St. Mary's	Somerset	Talbot	Washington County	Wicomico	Worcester	TOTAL FY2016	CUMULATIVE FY1988-2016
		1	5										18	687
													0	47
													0	2
	2		1				2						12	879
								6	2		7	5	25	1,010
			1	1		1	1						5	529
1	4			1	2	2	1			12			54	1,330
													0	11
										1			4	18
					2					1			4	4
						1							1	1,691
	6	2	14		1	7							33	1,911
	6	8	35	1		12	10		2	1			150	5,033
	4		2	2	1	6		6	3	7	8	2	76	1,068
	1		1	1		3			1	2			12	442
													0	2
	1	1								7			35	1,537
										1			8	202
										3			12	12
	2			1		3			1	10			31	780
													0	50
			2		1	1							5	1,111
		1											6	1,192
	1	1			1					1			24	526
													0	61
													0	72
													0	90
1	3		1	1		2		6	3	7	5	4	60	2,291
													0	15
													0	45
						5							6	42
										1			2	195
	4	2								4			25	2,098
						1			3				4	32
2	34	16	62	8	8	44	14	18	15	58	20	11	612	25,015

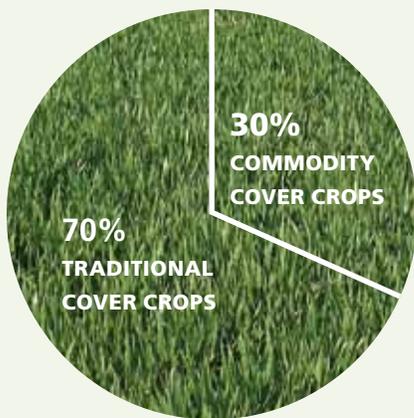
SPECIAL PROJECT GRANTS

The Maryland Agricultural Water Quality Cost-Share Program receives special funding from the Chesapeake Bay Restoration Fund and the Chesapeake and Atlantic Coastal Bays Trust Fund to finance highly valued best management practices included in Maryland's Watershed Implementation Plan to reduce nutrients and sediment from entering the Chesapeake Bay and its tributaries by 2025. These include the Cover Crop Program and contract signing incentive payment for the Conservation Reserve Enhancement Program (CREP) along with portions of the Manure Transport Program and grants for nutrient management practices such as manure injection and incorporation.

COVER CROP PROGRAM 2015-2016

DISTRICT	Contracts	Fall Certified Acres	MACS Payment
Allegany	9	464	\$26,416
Anne Arundel	32	4,492	\$239,996
Baltimore County	45	11,087	\$531,654
Calvert	19	3,914	\$165,092
Caroline	144	42,506	\$1,844,467
Carroll	141	32,065	\$1,668,093
Cecil	76	20,115	\$1,048,596
Charles	35	8,177	\$339,744
Dorchester	117	40,874	\$1,941,027
Frederick & Catocctin	190	34,755	\$1,818,498
Garrett	20	1,016	\$78,415
Harford	84	18,041	\$986,466
Howard	18	2,425	\$120,889
Kent	118	55,227	\$2,863,717
Montgomery	38	17,843	\$807,577
Prince George's	24	2,109	\$106,969
Queen Anne's	147	59,717	\$2,829,186
St. Mary's	68	8,970	\$400,969
Somerset	48	16,981	\$723,793
Talbot	91	51,453	\$2,382,767
Washington County	67	11,369	\$577,999
Wicomico	81	23,439	\$1,296,097
Worcester	66	34,165	\$1,785,116
TOTAL	1,678	501,204	\$24,583,543

Acres Planted in Cover Crops



Cover Crop Program

The amount of Maryland farmland planted in cover crops has increased dramatically over the last several years—from fewer than 210,000 acres planted during the 2009-2010 planting season to more than 500,000 acres planted this year. Cover crops are cereal grains, such as wheat, rye, and barley, and brassicas (plants in the cabbage family) that grow in cool weather and provide a “living protective cover” on newly harvested fields. They recycle unused plant nutrients remaining in the soil and shield fields against erosion caused by wind, rain, ice, and snow. Cover crops also can help improve soil health, reduce weed and insect pests, and protect fields against extreme weather conditions brought on by too much or too little rain.

The department provides farmers with grants to help offset seed, labor, and equipment costs associated with planting cover crops immediately following the summer crop harvest. In Fiscal Year 2016, farmers who planted traditional cover crops received up to \$90 per acre. Traditional cover crops may not be harvested but can be grazed or chopped for on-farm livestock forage after becoming well established. Cover crops planted for harvest also provide water quality benefits and qualified for up to \$35 an acre if rye was planted as the cover crop. During the 2015-2016 planting season, 30 percent of the cover crops planted were harvested.

Manure Transport

As Maryland farmers begin to comply with the state's new Phosphorus Management Tool regulations, the Manure Transport Program has taken on even greater importance. Phosphorus runoff has been identified as a major threat to water quality in streams, rivers, and the Chesapeake Bay. While poultry litter and livestock manure make an excellent fertilizer and soil amendment, using these resources to meet the nitrogen needs of crops may result in an over-application of phosphorus. Maryland's Manure Transport Program helps poultry, dairy, beef, and other livestock producers transport manure to other farms or alternative use facilities that can use the resource safely.

In Fiscal Year 2016, the program provided Maryland farmers with \$954,300 in state-funded grants to transport 213,151 tons of manure to approved farms and businesses. Since 2013, the program has seen a four-fold increase in the amount of manure transported. Nearly 25 percent of the manure was shipped to alternative use facilities and not land applied in the watershed. Delmarva poultry companies provided \$447,882 in matching funds to transport poultry litter, bringing the total amount of financial support provided to farmers through the transport program to \$1,402,182.



SINCE 2013, THE MANURE TRANSPORT PROGRAM HAS SEEN A FOUR-FOLD INCREASE IN THE AMOUNT OF MANURE TRANSPORTED.

MANURE TRANSPORT PROGRAM PAYMENT SUMMARY

FISCAL YEAR	Actual Tons Transported	MACS Payment	Poultry Companies Cost-Share Payment*	Total Funds Issued
FY1999	1,896	\$17,992	\$17,992	\$35,984
FY2000	13,366	\$111,464	\$111,464	\$222,928
FY2001	20,477	\$195,559	\$195,559	\$391,118
FY2002	47,481	\$434,610	\$420,395	\$855,005
FY2003	28,556	\$233,444	\$229,645	\$463,089
FY2004	40,755	\$295,356	\$285,806	\$581,162
FY2005	36,329	\$239,196	\$200,113	\$439,309
FY2006	69,009	\$380,694	\$293,728	\$674,422
FY2007	99,297	\$490,011	\$356,955	\$846,966
FY2008	99,817	\$520,357	\$370,985	\$891,342
FY2009	119,892	\$663,177	\$504,024	\$1,167,201
FY2010	80,899	\$469,398	\$402,846	\$872,244
FY2011	61,150	\$354,011	\$294,383	\$648,394
FY2012	35,554	\$297,587	\$283,951	\$581,538
FY2013	52,481	\$377,007	\$339,252	\$716,259
FY2014	118,995	\$608,259	\$419,929	\$1,028,188
FY2015	167,237	\$851,304	\$409,548	\$1,260,852
FY2016	213,151	\$ 954,300	\$447,882	\$1,402,182
TOTAL	1,306,342	\$ 7,493,726	\$5,584,457	\$13,078,183

*Dairy, beef and other livestock producers became eligible for cost-share grants in Fiscal Year 2002 and do not receive matching funds from poultry companies.



Conservation Reserve Enhancement Program

Protecting and enhancing the health of Maryland's creeks and streams is vital to the success of the larger Bay cleanup effort. Maryland's Conservation Reserve Enhancement Program is a federal-state partnership that pays landowners annual rental payments to take environmentally sensitive cropland near streams out of production for 10 to 15 years and plant streamside buffers, create wetlands, protect highly erodible land from washing away, and establish wildlife habitat for endangered species.

The Maryland Agricultural Water Quality Cost-Share Program provides landowners with grants to establish conservation practices on land that they have enrolled in CREP. Special funds are used to award a \$100/acre signing bonus to farmers who enroll in the program or re-enroll the land after their initial contracts expire. In Fiscal Year 2016, the program provided landowners with \$510,096 in signing bonuses and \$359,345 in cost-share funds to install fences, watering troughs, and other stream protection practices on land enrolled in the Conservation Reserve Enhancement Program.

THE CONSERVATION RESERVE ENHANCEMENT PROGRAM IS A FEDERAL-STATE PARTNERSHIP PROGRAM THAT HELPS LANDOWNERS PROTECT ENVIRONMENTALLY SENSITIVE LAND.

CREP PROJECTS COMPLETED BY DISTRICT FISCAL YEAR 2016

DISTRICT	Completed Projects	MACS Payment
Allegany	3	\$14,793
Caroline	1	\$2,010
Carroll	35	\$109,729
Catoctin	3	\$16,652
Dorchester	4	\$4,958
Frederick	10	\$54,310
Harford	1	\$8,235
Howard	3	\$23,264
Kent	5	\$8,562
Queen Anne's	1	\$10,366
Talbot	3	\$41,317
Washington County	9	\$65,149
TOTAL	78	\$359,345



MANURE INJECTION AND INCORPORATION HELPS PREVENT NITROGEN AND PHOSPHORUS FROM IMPACTING WATERWAYS AND REDUCES ODORS.

Manure Injection and Incorporation Grants

Maryland's nutrient management regulations require farmers to inject or incorporate manure and other organic nutrient sources into the soil within 48 hours of application. Injecting or incorporating manure into the soil reduces odors, preserves surface residue, and helps prevent nitrogen and phosphorus from impacting waterways. Assistance is available to hire custom operators, rent or lease equipment, or offset operating costs associated with using secondary tillage equipment to inject or incorporate manure into the soil.

In Fiscal Year 2016, the program provided 95 farmers with \$479,101 in grants to inject or incorporate manure and other organic products into cropland within 48 hours of application.

SOIL CONSERVATION DISTRICTS BRING MACS TO FARMERS

Maryland's 24 soil conservation districts—with technical guidance from USDA's Natural Resources Conservation Service—help farmers choose the right best management practices for their farming operations, supervise their installation or construction, and develop maintenance plans to keep them in good working order. District staff help farmers calculate costs to install practices and apply for other state and federal grant and loan programs. Best management practices are usually installed as part of a farm's overall Soil Conservation and Water Quality Plan. These plans are developed free of charge by district technical staff to help farmers identify, protect, and enhance natural resources on their farms.

MARYLAND'S SOIL CONSERVATION DISTRICTS

Allegany	301-777-1747, ext. 3
Anne Arundel	410-571-6757
Baltimore County	410-527-5920, ext. 3
Calvert	410-535-1521, ext. 3
Caroline	410-479-1202, ext. 3
Carroll	410-848-8200, ext. 3
Catoctin	301-695-2803, ext. 3
Cecil	410-398-4411, ext. 3
Charles	301-934-9588, ext. 3
Dorchester	410-228-3733, ext. 3
Frederick	301-695-2803, ext. 3
Garrett	301-334-6950, ext. 3
Harford	410-838-6181, ext. 3
Howard	410-313-0680
Kent	410-778-5150, ext. 3
Montgomery	301-590-2855
Prince George's	301-574-5162, ext. 3
Queen Anne's	410-758-3136, ext. 3
St. Mary's	301-475-8402, ext. 3
Somerset	410-621-9310
Talbot	410-822-1577, ext. 3
Washington County	301-797-6821, ext. 3
Wicomico	410-546-4777, ext. 3
Worcester	410-632-5439, ext. 3



Maryland Department of Agriculture

Office of Resource Conservation

Conservation Grants Program

50 Harry S. Truman Parkway
Annapolis, MD 21401
410-841-5864
mda.maryland.gov



Larry Hogan, *Governor*
Boyd K. Rutherford, *Lt. Governor*
Joseph Bartenfelder, *Secretary*
James P. Eichhorst, *Deputy Secretary*