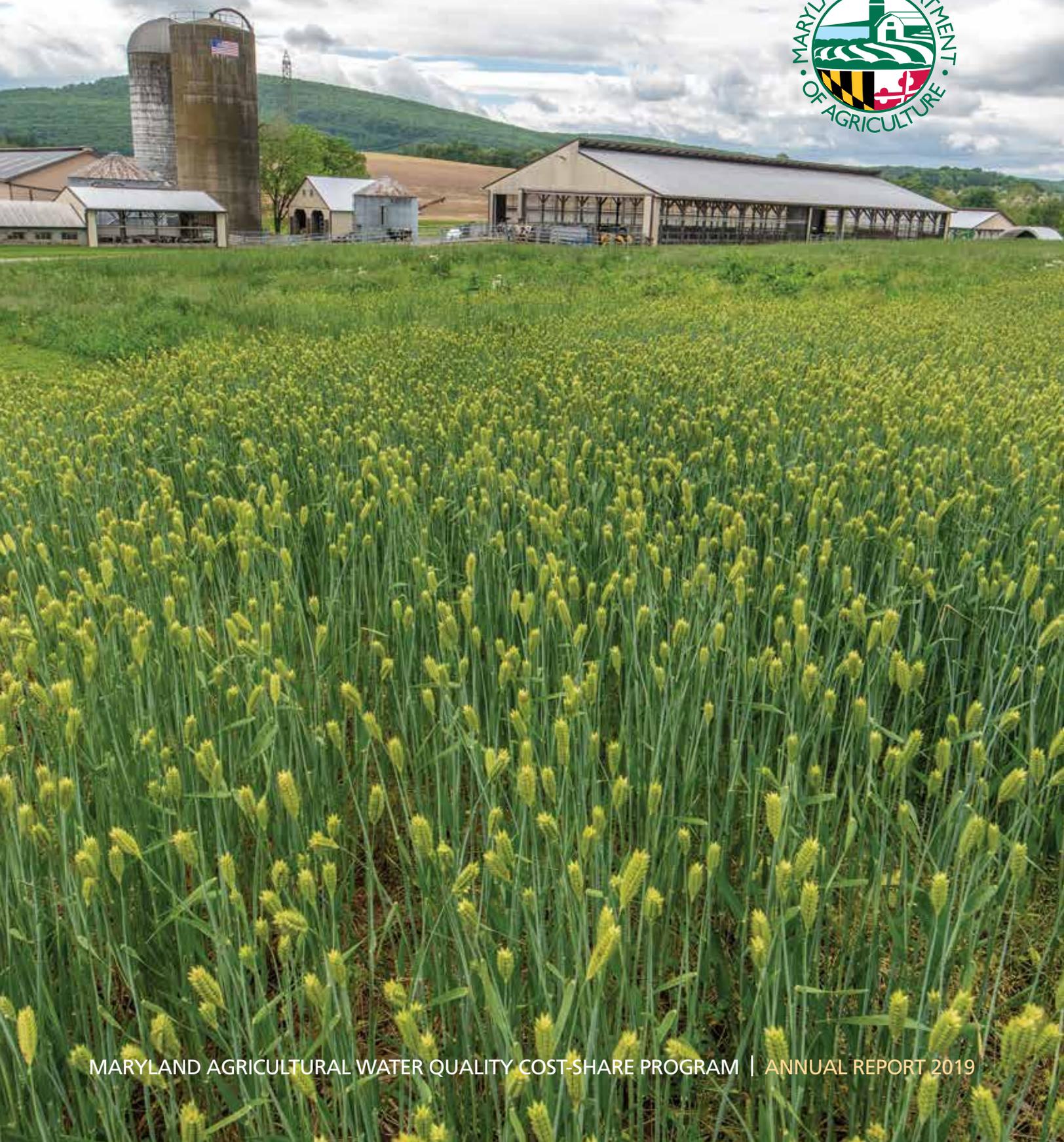


# Making Daily Tasks Easier

*and the Bay Healthier*





## Message from *the Secretary*

It has been said that a farmer's work is never done, and nobody knows that better than livestock and poultry farmers who are responsible for the care and well-being of their animals, as well as the health and sustainability of natural resources on their farms and statewide.

I am very proud of the important role that MACS plays in helping farmers finance conservation practices on their farms to protect water quality, and I also take pride in the knowledge that many of these practices make the hard work of running a farm a little easier.

This year, we saw an increase in the number of heavy use areas installed by livestock and poultry farmers. These concrete walkways and pads allow farmers to scrape up manure more easily and manage it for future use. Likewise, concrete pads installed at chicken house entrances make cleanouts quicker and cleaner. In Maryland's pastures, farmers who installed buffers, watering troughs, livestock crossings, and exclusion fencing report that the practices

improved stream health, provided a reliable water source for their animals, and made moving cattle safer and faster.

Crop farmers looking to improve their soil and protect water quality know they can count on MACS for grants to plant fall cover crops. When prolonged rainfall caused some growers to miss this year's planting deadline, MACS developed a pilot program that allowed farmers to plant an extended season "healthy soil biomass" in place of a cover crop. The pilot project provided additional water quality benefits for approximately 10,000 acres and led to the addition of a new Extended Season incentive option for the 2019-2020 cover crop season.

Helping farmers comply with regulatory requirements and meet Maryland's Chesapeake Bay cleanup goals remains at the heart of our program. The Manure Transport Program had another record-breaking year as

it moved 249,840 tons of manure away from areas with high soil phosphorus levels.

Looking ahead, I am pleased to report that MACS will add several conservation drainage management practices to its menu of eligible BMPs in 2020. These new practices will help Eastern Shore farmers install new technologies, buffers, and wetlands to reduce sediment and nutrient losses from crop fields. When fully implemented, these practices will help farmers manage drainage water more efficiently and contribute toward Maryland's efforts to meet its nitrogen reduction targets for the Bay.

The following report more fully describes how MACS makes the daily tasks of running a farm easier, protecting water quality more affordable, and the Chesapeake Bay and its tributaries cleaner and healthier.

*Joseph Bartenfelder*

**Joe Bartenfelder**  
Maryland Agriculture Secretary

## MACS Makes a Difference *for the Bay*

Since 1984, the Maryland Agricultural Water Quality Cost-Share (MACS) Program has helped thousands of Maryland farmers finance water quality improvement projects on their farms, invest in sustainable agricultural practices, and comply with federal, state, and local environmental requirements.

MACS provides farmers with conservation grants that cover up to 87.5 percent of the cost to install more than 30

best management practices on their farms to control erosion, manage nutrients, and protect water quality. MACS grants are essential in helping farmers finance practices that meet nutrient and sediment targets outlined in Maryland's comprehensive plan to restore the Chesapeake Bay.

MACS is delivered by the state's 24 soil conservation districts with technical guidance from USDA's Natural Resources Conservation Service (NRCS).

## Chesapeake Bay Cleanup—*the Final Push*

In April 2019, Maryland submitted its third and final Watershed Implementation Plan (WIP) to the U.S. Environmental Protection Agency (EPA). The Phase III plan—which builds on previous work and includes substantial public input—outlines additional steps Maryland will take to achieve its pollution reduction goals for the Bay by 2025.

An EPA assessment of Maryland's cleanup progress through June 2018 showed that the state continues to meet its phosphorus and sediment reduction goals, but that additional focus is needed to reduce nitrogen levels in the Bay. The agricultural component of Maryland's plan includes the addition

of five new MACS-supported best management practices focusing on conservation drainage for low-lying areas primarily located on Maryland's Eastern Shore. Once they are implemented, the new practices are expected to further reduce nitrogen runoff into local waterways and help Maryland meet its nutrient reduction targets. MACS staff is finalizing technical standards and specifications for these conservation drainage practices, which should be available to farmers in early 2020.

## Profile: *Valley Ho Farm*



When Chris and Jamie Derr decided to return to dairy farming in 2012, MACS helped make it happen. After updating the existing barn on the family owned and operated farm, the first order of business was to install a waste storage structure and travel lane, both cost-shared by MACS. "The cost-share funding allowed us to make the transition," said Chris. "We started milking the next year."

In 2019, the farm family installed a heavy use area (HUA) using MACS funds. The concrete-grooved surface allows equipment to quickly and easily scrape manure into a receiving tank. "I hate mud and slop," says Chris. "The HUA keeps the place neater and the cows cleaner."

Tucked into the scenic Middletown Valley of Frederick County, Valley Ho Farm is owned and operated by the Burrier and Derr families. The 4th generation farm family milks 70 Holstein cows, raises 80 heifers, and grows corn, soybeans, barley, hay, and sudan grass on approximately 230 acres. The storage system allows the family to use the manure generated on the farm as a crop fertilizer and soil conditioner when field conditions are right. "We are 100 percent no till," says Chris. "The manure really improves soil health and it definitely saves money on fertilizer costs."

To further protect water quality, the farm family plants cover crops in the fall using MACS cost-share grants. Last year, the family planted approximately 60 acres of wheat and radish. "The cost-share really helps justify the expense," adds Chris.

## 2019 Funding Summary

In FY19, the Maryland Agricultural Water Quality Cost-Share Program provided farmers with \$23.3 million in cost-share grants to install or implement 1,852 conservation projects on their farms to prevent soil erosion, manage crop nutrients, and protect water quality. Grants cover up to 87.5 percent of the cost to install more than 30 eligible best management practices, including cover crops, grassed waterways, manure storage structures, and stream protection practices. Farmers receiving these grants invested about \$700,165 of their own money into projects that will prevent an estimated 2.6 million pounds of nitrogen, 23,963 pounds of phosphorus, and 4,712 tons of soil from entering Maryland waterways.

Low Interest Loans for Agricultural Conservation (LILAC) provide farmers with startup funds to get a project up and running. Guaranteed by the Maryland Water Quality Revolving Loan Fund, LILAC loans are typically offered at below market rates and are available at participating lending institutions statewide. In FY19, MACS provided farmers with \$589,683 in LILAC loans. Loans were used to help farmers finance manure handling and conservation equipment, no-till equipment, a roof runoff system and other construction costs.

## PROGRAM SUMMARY | FISCAL YEAR 2019

CAPITAL PROJECTS	NUMBER OF PROJECTS	FUNDS
Total Approved from State Funds	359	\$ 6,992,530

Capital Projects Completed		
CREP Projects with State Funds	17	60,821
All Other Projects with State Funds	154	4,750,418
With Federal Funds	21	98,466
<b>Total Capital Projects Completed</b>	<b>192</b>	<b>\$ 4,909,705</b>

Special Projects Completed		
Cover Crops	1,283	17,054,952
Manure Transport <sup>1</sup>	324	1,070,479
Manure Injection	53	\$338,447
<b>Total Special Projects Completed</b>	<b>1660</b>	<b>\$18,463,878</b>
<b>Total Capital &amp; Special Projects Completed</b>	<b>1,852</b>	<b>\$23,373,583<sup>2</sup></b>

ENVIRONMENTAL BENEFITS	NITROGEN	PHOSPHORUS
Estimated Pounds of Nutrients Removed by Capital Projects	103,271	21,060
Estimated Pounds of Nutrients Removed by Cover Crops	2,504,534	2,903
	<b>Tons of Soil</b>	<b>Acres of Land</b>
Tons of Soil Saved Per Year <sup>3</sup>	4,712	1,490
<b>Manure Managed Daily with Animal Waste Storage Structures</b>	<b>Tons of Manure</b>	<b>Animal Units<sup>4</sup></b>
Poultry Manure Managed Daily	699	34,111
Dairy Manure Managed Daily	18	494
Beef Manure Managed Daily	18	555
Other Animal Manure Managed Daily	5	686
<b>Total Animal Manure Managed Daily</b>	<b>740</b>	<b>35,846</b>

<sup>1</sup> Does not include poultry company matching funds (\$373,875)

<sup>2</sup> Includes approximately \$12.8 million in special funds from the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund

<sup>3</sup> Based on the Revised Universal Soil Loss Equation (RUSLE)

<sup>4</sup> One 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 latest Chesapeake Bay Model.



Heavy use areas allow farmers to easily scrape manure into a receiving tank. The concrete grooved surface keeps the animals cleaner and healthier.

## Capital *Projects*

The majority of the conservation projects funded by MACS are financed through the capital program by the sale of general obligation bonds. In FY19, MACS provided farmers with \$4.9 million to install 192 conservation projects on their farms containing 266 best management practices. Many of these projects improve the way farmers handle manure, manage livestock, and protect streams. Top practices installed during the year include heavy use areas (52) waste storage structures (44), grassed waterways (43), animal mortality facilities (26), grade stabilization structures (18), roof runoff structures (13), livestock exclusion fencing (13) and riparian forest buffers (10). *Please see center spread for a complete list of best management practices installed with capital funds during FY19.*

### SOIL CONSERVATION DISTRICT SUMMARY FOR CAPITAL PROJECTS | FISCAL YEAR 2019

DISTRICT	COMPLETED PROJECTS	MACS PAYMENT
Allegany	2	\$ 3,710
Anne Arundel	1	\$ 2,250
Baltimore County	8	\$ 129,385
Calvert	1	\$ 5,868
Caroline	20	\$ 912,958
Carroll	30	\$ 760,290
Catoctin	2	\$ 7,665
Cecil	1	\$ 16,538
Charles	1	\$ 36,275
Dorchester	3	\$ 41,094
Frederick	15	\$ 264,949
Garrett	3	\$ 134,531
Harford	12	\$ 59,066
Howard	1	\$ 21,739
Kent	23	\$ 130,659
Montgomery	1	\$ 43,664
Prince George's	3	\$ 38,902
Queen Anne's	18	\$ 518,482
Somerset	2	\$ 41,801
St. Mary's	4	\$ 119,705
Talbot	1	\$ 19,635
Washington County	11	\$ 141,920
Wicomico	22	\$1,139,047
Worcester	7	\$ 319,572
<b>Total</b>	<b>192</b>	<b>\$4,909,705</b>

# Completed MACS *Cost-Shared Practices by District* | FISCAL YEAR 2019



Allegany  
Anne Arundel  
Baltimore County  
Calvert  
Caroline  
Carroll  
Catoctin  
Cecil  
Charles  
Dorchester  
Frederick

Animal Mortality					6						1
Conservation Cover						1					
Contour Farming											
Contour Orchard											
Critical Area Planting	1				1					1	
Diversion										1	
Fencing	1		1	1		1			1		3
Field Border											
Filter Strip											
Forage & Biomass Planting											
Grade Stabilization Structure								1		1	
Grassed Waterway			6			6		1		1	5
Heavy Use Area Protection	1				8	10					3
Lined Waterway or Outlet							1			1	
Livestock Pipeline											
Riparian Forest Buffer						4	1				4
Riparian Herbaceous Cover										1	
Roofs and Covers						5					
Roof Runoff Structure					1	3					3
Sediment Basin											
Sediment Control Pond											
Spring Development	1	1									
Stream Crossing	1										1
Strip Cropping, Contour											
Strip Cropping, Field											
Terrace System											
Vegetated Treatment Area											
Waste Storage Structure			1		10	5					1
Waste Treatment Lagoon											
Wastewater Treatment Strip											
Water Control Structure											
Water Well											
Watering Facility	1		1			1					1
Wetland Restoration											
<b>Total</b>	<b>6</b>	<b>1</b>	<b>9</b>	<b>1</b>	<b>26</b>	<b>36</b>	<b>2</b>	<b>2</b>	<b>1</b>	<b>6</b>	<b>22</b>



Garrett  
Harford  
Howard  
Kent  
Montgomery  
Prince George's  
Queen Anne's  
St. Mary's  
Somerset  
Talbot  
Washington County  
Wicomico  
Worcester  
Total FY 2019  
Cumulative FY88-19

						2		2			12	3	26	1,069
													1	700
													0	47
													0	2
	2						2						7	898
	1					1			1	1			5	540
											5		13	1,382
													0	12
													0	18
													0	7
	1	1	7		2	3	1		1				18	1,945
	1		20			2				1			43	5,143
1	4		2			5	1			5	9	3	52	1,191
	2					2	1		1				8	465
													0	2
											1		10	1,559
						2							3	220
2							1						8	40
2	1				1		1			1			13	820
													0	51
													0	1,113
	1												3	1,199
											1		3	542
													0	61
													0	72
													0	90
													0	1,692
1	1			1		4	1	1		2	13	3	44	2,401
													0	15
													0	45
													0	45
						1							1	201
	1					1				1			7	2,147
												1	1	41
6	15	1	29	1	3	23	8	3	3	18	34	10	266	25,775

## Special Project *Grants*

MACS receives special funding from the Chesapeake Bay Restoration Fund and the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund to finance highly valued best management practices included in Maryland's cleanup plan for the Bay. These include the state's popular Cover Crop Program and the contract signing incentive payment for the Conservation Reserve Enhancement Program (CREP), along with portions of the Manure Transport Program, and grants to hire personnel and equipment to inject manure below the soil surface to reduce odors and nutrient losses.

### COVER CROP PROGRAM

Cover crops are widely used by Maryland farmers to protect water quality in the Chesapeake Bay and its tributaries. Due to their numerous environmental benefits, cover crops are a key feature in Maryland's federally approved plan to reduce nutrients and sediment from reaching the Chesapeake Bay and its tributaries.

Cover crops are cereal grains such as wheat, rye, and barley or mixed-species crops that grow in cool weather. They are planted in the fall following the harvest of summer cash crops. As they grow, cover crops take up leftover nutrients from the summer crop, provide a living cover to protect fields from erosion over the winter months, and improve the health of the soil for the next year's crop.

MACS provides grants to help farmers offset seed, labor, and equipment costs associated with planting cover crops. During the 2018-2019 planting season, farmers planted 362,976 acres of cover crops using \$17,054,952 in cost-share

### COVER CROP PROGRAM 2018-2019

DISTRICT	CONTRACTS	FALL CERTIFIED ACRES	MACS PAYMENT
Allegany	5	313	\$ 15,744
Anne Arundel	26	3,937	\$ 233,046
Baltimore County	33	8,281	\$ 406,114
Calvert	14	1,713	\$ 74,938
Caroline	116	28,374	\$ 1,310,270
Carroll	100	18,774	\$ 894,241
Cecil	61	13,904	\$ 693,759
Charles	26	4,583	\$ 228,660
Dorchester	99	33,066	\$ 1,597,778
Frederick & Catoclin	138	21,853	\$ 981,520
Garrett	14	648	\$ 40,287
Harford	54	9,377	\$ 482,257
Howard	11	1,497	\$ 66,148
Kent	98	52,490	\$ 2,549,796
Montgomery	33	13,845	\$ 445,328
Prince George's	14	2,156	\$ 118,124
Queen Anne's	116	48,349	\$ 2,207,911
St. Mary's	48	5,599	\$ 237,224
Somerset	29	10,654	\$ 399,290
Talbot	71	32,718	\$ 1,514,268
Washington County	55	6,844	\$ 336,674
Wicomico	69	18,004	\$ 866,272
Worcester	53	25,997	\$ 1,355,303
<b>Total</b>	<b>1,283</b>	<b>362,976</b>	<b>\$17,054,952</b>



grants. Historic rains played a significant role in reducing the 2018-2019 cover crop planting, as Maryland recorded one of the wettest years on record.

To salvage what remained of a difficult planting season, a Healthy Soil Biomass Pilot Project was offered to farmers who were approved to plant cover crops, but unable to plant all of their acreage by the November 2 deadline. The pilot project paid farmers \$45 per acre to plant qualifying small grains by December 1 in unplanted fields to create a healthy soil biomass. To extend water quality benefits, farmers were required to delay termination until May 1. Approximately 15,000 acres were planted, however only two-thirds of this acreage matured into a robust soil biomass that could provide water quality benefits. Based on the results of this pilot, MACS will offer an Extended Season incentive option for the 2019-2020 Cover Crop planting season.



One of the best ways to protect water quality is to plant trees, shrubs or grasses next to streams to create a buffer to filter runoff coming off the land.

### CONSERVATION RESERVE ENHANCEMENT PROGRAM

Now in its 22nd year, Maryland's Conservation Reserve Enhancement Program (CREP) has helped thousands of Maryland landowners plant streamside buffers, establish wetlands, protect highly erodible land, and create wildlife habitat on their property. CREP is a state-federal conservation partnership that pays landowners annual rental payments to take environmentally sensitive land out of production and install conservation practices that protect water quality and provide wildlife habitat. Rental contracts range from 10 to 15 years for this voluntary program.

MACS provides CREP landowners with cost-share grants to install livestock exclusion fencing, watering troughs, stream crossings, buffers, wetlands, and other best management practices on land enrolled in CREP. In FY19, MACS provided landowners with \$60,821 in grants to install 17 stream protection projects. Approximately \$280,342 in special funds were used to award a \$100 per acre signing bonus to landowners who enrolled or re-enrolled land in the program. During the year, the USDA's Farm Service Agency suspended program enrollment following the expiration of the 2014 Farm Bill. Enrollment was reopened several months later in June 2019.



Maryland farmers planted 362,976 acres of protective cover crops last year with the help of MACS grants.

### CREP PROJECTS COMPLETED BY DISTRICT | FISCAL YEAR 2019

DISTRICT	COMPLETED PROJECTS	MACS PAYMENT
Carroll	6	\$13,251
Catoctin	1	\$ 4,538
Dorchester	1	\$ 355
Frederick	4	\$35,795
Queen Anne's	2	\$ 1,480
Washington County	2	\$ 4,702
Worcester	1	\$ 700
<b>Total</b>	<b>17</b>	<b>\$60,821</b>

# Manure *Transport Program*

Established by the Water Quality Improvement Act of 1998, Maryland's Manure Transport Program provides cost-share grants to help livestock producers truck manure away from farms with high soil phosphorus levels to other farms or alternative use facilities that can use the product safely based on their nutrient management plans.

The Program has experienced tremendous growth in recent years as farmers transition to Maryland's

new Phosphorus Management Tool (PMT). Adopted in 2015, the PMT uses the latest science to calculate the risk of phosphorus reaching waterways from over-enriched fields. Although manure makes an excellent fertilizer and soil conditioner, it typically contains more phosphorus than most crops can use, prohibiting its use as a fertilizer on high-risk fields identified by the Phosphorus Management Tool.

In FY19, Maryland's Manure

Transport Program provided a record \$1.07 million in cost-share grants to transport 249,840 tons of manure to approved farms and businesses. Delmarva poultry companies provided \$373,875 in matching funds to transport poultry litter, bringing the total amount of financial support provided through the transport program to \$1,444,353.

Livestock manure (dairy, beef and swine) comprised 73 percent of the manure transported during

## MANURE TRANSPORT PROGRAM PAYMENT SUMMARY

FISCAL YEAR	ACTUAL TONS TRANSPORTED	MACS PAYMENT	POULTRY COMPANIES COST-SHARE PAYMENT*	TOTAL FUNDS ISSUED
1999	1,896	\$ 17,992	\$ 17,992	\$ 35,984
2000	13,366	\$ 111,464	\$ 111,464	\$ 222,928
2001	20,477	\$ 195,559	\$ 195,559	\$ 391,118
2002	47,481	\$ 434,610	\$ 420,395	\$ 855,005
2003	28,556	\$ 233,444	\$ 229,645	\$ 463,089
2004	40,755	\$ 295,356	\$ 285,806	\$ 581,162
2005	36,329	\$ 239,196	\$ 200,113	\$ 439,309
2006	69,009	\$ 380,694	\$ 293,728	\$ 674,422
2007	99,297	\$ 490,011	\$ 356,955	\$ 846,966
2008	99,817	\$ 520,357	\$ 370,985	\$ 891,342
2009	119,892	\$ 663,177	\$ 504,024	\$ 1,167,201
2010	80,899	\$ 469,398	\$ 402,846	\$ 872,244
2011	61,150	\$ 354,011	\$ 294,383	\$ 648,394
2012	35,554	\$ 297,587	\$ 283,951	\$ 581,538
2013	52,481	\$ 377,007	\$ 339,252	\$ 716,259
2014	118,995	\$ 608,259	\$ 419,929	\$ 1,028,188
2015	167,237	\$ 851,304	\$ 409,548	\$ 1,260,852
2016	213,151	\$ 954,300	\$ 447,882	\$ 1,402,182
2017	241,941	\$ 1,174,690	\$ 453,038	\$ 1,627,728
2018	249,421	\$ 1,020,910	\$ 453,876	\$ 1,474,786
2019	249,840	\$ 1,070,479	\$ 373,875	\$ 1,444,353
<b>Total</b>	<b>2,047,544</b>	<b>\$10,759,805</b>	<b>\$6,865,246</b>	<b>\$17,625,050</b>

\*Dairy, beef and other non-poultry livestock producers do not receive matching funds from poultry companies.



The Manure Transport Program had another record year as farmers moved 249,840 tons of manure away from areas with high soil phosphorus levels.

the year. Since fields near barnyard areas tend to have much higher phosphorus levels, dairy farmers typically use the grants to help cover the cost of hauling liquid and solid manure to more distant fields with acceptable phosphorus levels. If the livestock or dairy operation is unable to safely apply all of its manure on its surrounding cropland, it is hauled to other farms.

Poultry litter comprised the remaining 27 percent of the manure transported during the year. The majority of the poultry litter (22 percent) was trucked to alternative use facilities with the remaining five percent land-applied to crops as a fertilizer.

### GRANTS FOR LIQUID MANURE INJECTION

Maryland's nutrient management regulations require farmers to incorporate or inject manure into tilled soil within 48 hours of application. Injecting liquid manure below the soil surface—as opposed to spreading it on top—provides additional environmental and water quality benefits. Liquid manure that has been injected into the soil using

special equipment helps prevent nutrient runoff, reduces odors, and preserves beneficial surface residue. Cost-share assistance is available to farmers who hire custom operators or rent equipment to inject liquid manure into their fields. In FY19, MACS provided 53 farmers with \$338,447 in grants to inject manure into the soil.



Grants for liquid manure injection help farmers comply with Maryland's nutrient management regulations. Injecting manure into the soil cuts down on odors and reduces the risk of runoff to nearby waterways.

# Maryland's *Soil Conservation Districts*

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 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. Soil conservation districts develop these plans free of charge to help farmers identify, protect, and enhance natural resources on their farms and protect water quality.

## MARYLAND'S SOIL CONSERVATION DISTRICTS

Allegany	301-777-1747, ext. 3	alleganyscd.com
Anne Arundel	410-571-6757	aascd.org
Baltimore County	410-527-5920, ext. 3	bcscd.org
Calvert	410-535-1521, ext. 3	calvertsoil.org
Caroline	410-479-1202, ext. 3	
Carroll	410-848-8200, ext. 3	carrollsoil.com
Catoctin	301-695-2803, ext. 3	catocctinfrederickscd.com
Cecil	410-398-4411, ext. 3	cecilscd.com
Charles	301-638-3028	charlesscd.com
Dorchester	410-228-5640, ext. 3	
Frederick	301-695-2803, ext. 3	catocctinfrederickscd.com
Garrett	301-501-5856, ext. 3	garrettscd.org
Harford	410-638-4828	harfordscd.org
Howard	410-313-0680	howardscd.org
Kent	410-778-5150, ext. 3	kentsoilandwaterconservationdistrict.org
Montgomery	301-590-2855	montgomeryscd.org
Prince George's	301-574-5162, ext. 3	pgscd.org
Queen Anne's	410-758-3136, ext. 3	qascd.com
St. Mary's	301-475-8402, ext. 3	stmarysscd.com
Somerset	410-621-9310	
Talbot	410-822-1577, ext. 5	talbotscd.com
Washington County	301-797-6821, ext. 3	conservationplace.com
Wicomico	410-546-4777, ext. 3	
Worcester	410-632-5439, ext. 3	



## Maryland Department of Agriculture

Office of Resource Conservation

Conservation Grants Program  
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