

NASA GSFC's 2016 – 2017 Programmatic Two-Year Milestones

Target Date (Year)	Milestone	Deliverable	Lead Agency	Comments/Status Updates
Urban Stormwater/Phase II MS4				
2017	Develop a stormwater management master plan and integrate it into the GSFC Facilities Master Plan to create a holistic approach for stormwater management and impervious surface restoration.	Develop a stormwater management strategy for restoration of impervious surface.	NASA GSFC	GSFC has evaluated potential restoration opportunities for new stormwater BMPs and retrofit of existing BMPs in anticipation of the requirement to restore 20% of impervious surface. The goal is to integrate these opportunities into master planning to develop a holistic approach to stormwater management.

Maryland's 2016 – 2017 Programmatic Two-Year Milestones

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Urban Stormwater/Phase II MS4				
			USDA/ARS/ BARC	
2016/2017	Implement Leachate Management Plan per MDE Permit requirements	Leachate Management Plan	USDA	
2016	Completed design for upgrading BARC East WWTP	Bid Ready Construction Documents	USDA	Design effort began October 2015
Stormwater - Other				
2016	Wetland and stream creation	The Beltsville Agricultural Research Center at 10300 Baltimore Avenue, Beltsville, Maryland is moving forward with a wetland and stream restoration project to restore, and reconnect MD state stream floodplains back to the watershed to improved water quality in partnerships with and NGO and PG County.	USDA/ARS/ BARC	13 acres of headwater wetland 1,800 linear feet of stream restoration
2016	Wetland Restoration	As part of the BARC CERCLA program a small area contaminated by chlorinated pesticides, and is also infested by phragmites will be treated and restored.		.03 acres
	Forest Buffers	BARC has 22.58 miles of streams with various amounts of forest cover. An estimated 16.90 miles of stream has a buffer area between 35' to 100' between the crop area and stream. Acreage does not include forest buffer that extends beyond 100' from the stream banks. In the prior period 36 acres of crop land is being taken out of crop production and planted to trees as part of the ICC Reforestation Project. In addition to land retirement, the addition of open/minimal forested was made available for		466 acres prior period 508 acres current period

Maryland's 2016-2017 Programmatic Milestones US Department of Agriculture, Agricultural Research Service, Beltsville
Agricultural Research Center

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		reforestation with the overall additional canopy being created is 42 acres.		
2015	Increase to Forest Canopy	BARC has also provided 2 acres to be reforested by Chestnuts and is requiring all activities in easements to provide mitigation in the form of reforestation or some other in-kind beneficial mitigation that will improve BARC water quality. Currently an additional four acres, used as a laydown area for utility work, on farmland determined to be no longer suitable for cropping due to soil conditions and deer pressure, will be reforested in the next two years period.		6 acres
Agriculture				
	BMP Description	Deliverable	USDA/ARS/ BARC	Acreage
2016 and 2017	BARC Annual Nutrient Management Plan	All crop acreage is included in the BARC Nutrient Management Plan and/or the University of Maryland Plan dependent on party responsible for the cropping program. This plan is revisited yearly with the goal of applying only the minimum amount of commercial fertilizer. BARC Nutrient management plan includes the goal of 100 per are met by recycling composted manure and bedding materials. BARCs goal is to recycle as much material as possible, and no materials are disposed of offsite. In FY14 BARC managed: 1.3 million gallons of liquid manure, 1,200 tons of manure solids, and 400 tons/cubic yards of other animal waste streams.		1621 acres
2016 and 2017	Prescribed Grazing	Dairy heifers are rotated on pastures 7 months per year. All pastures have 100 percent cover. Beef cows with calves are also rotated on pastures also with 100 percent cover for 9 months each growing season. Total permanent pasture acreage is 350 acres of which 50 acres is minimally fertilized.		Total pasture acreage is 350. 300 acres receives no fertilizer and - 50 acres receives minimal fertilizer.

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2016 and 2017	Animal Waste Management	All waste from the lactating dairy cows (110 cows) and 25% of the waste from replacement heifers (130 heifers) is pumped to a solids separator. The solids (+-8%) are moved to the Composting site. The liquid is pumped to the long range concrete holding tank until conditions and timing are acceptable for application to the cropping program.		
2016 and 2017	Compost Site	All non-liquid bedding from the remaining BARC livestock population plus the separated solids from the Dairy operation is accumulated with greenhouse materials and excess organic materials from the Road and Grounds Unit at the BARC composting site. The composting process reduces the estimated volume of 1000 yards to 500 yards. The final product is spread on cropped acreage and/or used in the Roads and Grounds Unit as a soil amendment.		
2016 and 2017	Barnyard Runoff	Most animal facilities include practices that minimizes/reduces clean water from moving through barnyards. This includes installation of gutters and diverting clean water away from the barnyard areas.		
2016 and 2017	Dairy Precision Feeding and Forage Management	Phosphorous levels in the dairy herd rations are formulated at a reduced level of less than 110% of NRC guidelines.		
2016 and 2017	Dairy Precision Feeding and Forage Management	Nitrogen levels in the dairy rations have been reduced to less than 110% of the NRC guidelines.		
2016 and 2017	Continuous No-till	All Nutrient Management acreage is continuous no-till except where research requirements/protocol require tillage. More than 95 percent of BARC maintains cover crops when not in production to reduce potential sedimentation runoff and organically improve the soil by increasing Phosphorous and Potassium naturally.		1350 acres

Maryland's 2016-2017 Programmatic Milestones US Department of Agriculture, Agricultural Research Service, Beltsville Agricultural Research Center

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2016 and 2017	Conservation Plans	Crop land is maintained in contoured or strip cropping to minimize soil erosion and nutrient loss. Most areas were initially designed by NCRS with some expansion through in-house design and construction.		350 acres
2016 and 2017	Phosphorous reduction	In Maryland if your soil test shows a value over 150 ppm of phosphorous based on the fertility index value (FIV) you cannot spread any additional phosphorus (P) on the field. BARC has continued to reduce P annually. Initial sampling conducted in 1998 showed FIV P levels of 196 ppm. By 2011 the FIV level was down to 103 ppm. Measurements taken in 2015 confirm this downward trend now trending below 100 ppm. It is anticipated that for 2016 and 2017 with the use of the GPS guided application these overall levels will be further reduced, and maintain levels below 100 ppm.		
2016 and 2017	Grass Buffer/ Waterways	BARC maintains grass buffers to filter runoff from cropped acreage. Buffers are defined as a sodded area (no minimum or maximum measurement) in drainage swales.		47 acres
2016 and 2017	Precision Agriculture	Soil samples are taken annually on all crop acreage. Management decisions concerning the fertility program for each field are based on the fertility level, the crop to be grown and the projected yield of the field. The purchases and lease of variable rate GPS guided applicator equipment will reduce the overall volume of nutrients entering the soil and available to runoff. The reduction of fertilizer through the implementation of the GPS precision application over the next two years should result considerable reduction of available nitrogen to the watershed as a result of limited to no overspraying. The total pounds applied during the next two years will be compared to historic data to determine the overall reduction of pounds of nitrogen.		\$75,000 obligated FY16

Maryland's 2016-2017 Programmatic Milestones US Department of Agriculture, Agricultural Research Service, Beltsville Agricultural Research Center

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2016 and 2017	Commodity Crop	Commodity crops acreage varies depending on the need for grain, forages and straw. The average for the last several years includes: Wheat (200 acres), Barley (110 acres), Corn (300ACRES), Soybeans (300 acres). Approximately 100 acres will be taken out of production in 2016/2017 for the installation of a solar project to meet is sustainability goals and provide the maximum amount of power for the area being converted. This reduction of farmland further reduce the P and K load on the watershed.		
2016 and 2017	Cover Crop	Cropped acreage that does not receive a commodity crop for the winter months receives one of various cover crops. The goal is to have 100% of cropland covered with vegetation during winter months. For 2016 and 2017 the amount and type of cover BARC will be using is as follows: Rye (500 acres), Wheat (150 acres. for cover), Radishes (75 acres), Triticale (25 acres), Ryegrass (150 acres), and Vetch (5 acres).		Cover types selected also vary as a result of the research being conducted.
2016 and 2017	Turfgrass surrounding buildings and adjacent areas and open field borders.	Fertilizer is no longer applied to turfgrass surrounding the facilities except research plots per protocols.		
2016 and 2017	Turfgrass areas to be converted to meadows.	More than 500 trees have been planted annually in turfgrass areas as part of a process to evaluate the conversion of mowed areas to sustainable meadow land use. BARC will be reviewing areas over the next two years for permanent conversion. These area may become no mow areas.		
2016 and 2017	Integrated Pest Management	All crop acreage uses Integrated Pest Management to minimize chemical usage with the exception of acreage that has research protocols requiring otherwise.		

USACE 2016 – 2017 Programmatic Two-Year Milestones

Target Date (Year)	Milestone	Deliverable	Lead Agency	Comments/Status Updates
Other				
2017	Assess existing and future BMPs for USACE properties in the CB watershed, as funding is made available	Assessment	USACE	
2017	Reissuance of the more streamlined MD state programmatic general permit, which includes wetland creation and living shorelines	Issuance	USACE	

USFWS

Location	Quantity	Units	BMP	Previous Use of Land
Blackwater	100	acres	Nitrogen fixing crops	Active Agriculture
Blackwater	27	acres	Tree Planting	Active Agriculture
Blackwater	300	acres	Management of Nutrients (Testing)	Active Agriculture
Blackwater	200	acres	Management of Runoff	Active Agriculture and Impoundment Management
Blackwater	90	acres	Cover Crop	Active Agriculture
Blackwater	300	acres	No Till	Active Agriculture
Blackwater	300	acres	Nutrient Management	Active Agriculture
Eastern Neck National Wildlife Refuge	200	square feet	Sediment Reduction	Trail
Patuxent Research Refuge - North	3	Systems	SepticPump	Septic
Patuxent Research Refuge - North	TBD	Feet	Non-Urban Stream Restoration	Forest
Patuxent Research Refuge - North	TBD	Acres Treated	EandS	Urban
Patuxent Research Refuge - North	Approx 500	Feet	DirtGravelDSA	Forest
Patuxent Research Refuge - North	< 1	Acres Treated	EandS	Urban
Patuxent Research Refuge - South and Central	4	Systems	SepticPump	Septic
Patuxent Research Refuge - South and Central	6	Acres	Lagoon	
Patuxent Research Refuge - South and Central	1.09	Acres	BarnRunoffCont	Agriculture
Patuxent Research Refuge - South and Central	1.09	Acres	CaptureReuse	
Patuxent Research Refuge - South and Central	1	Systems	SepticDenitrify	
Patuxent Research Refuge - South and Central	10.2	Acres Treated	EandS	Urban
Patuxent Research Refuge - South and Central	0.05	Acres Treated	PermPavSVUDCD	Urban
Patuxent Research Refuge - South and Central	1.07	Acres Treated	VegOpChanNoUDCD	Urban
Patuxent Research Refuge - South and Central	0.12	Acres	ImpSurRed	
Patuxent Research Refuge - South and Central	665	Acres	ConPlan	
Patuxent Research Refuge - South and Central	6	Acres	Tree Plant	

GSA

Facility	BMP	Unit	Amount
GSA - Census Computer Facility	Infiltration	acres treated	4440.43
GSA - Census Computer Facility	Infiltration	acres treated	3124.02
GSA - Harvey W. Wiley Federal Building	BioRetNoUDAB	acres treated	717.9
GSA - Harvey W. Wiley Federal Building	BioRetNoUDAB	acres treated	318.24
GSA - Harvey W. Wiley Federal Building	PermPavNoSVNoUDAB	acres treated	4038.52
GSA - Harvey W. Wiley Federal Building	PermPavNoSVNoUDAB	acres treated	1791.74
GSA - IRS New Carrollton	BioRetNoUDAB	acres treated	198.77
GSA - IRS New Carrollton	BioRetNoUDAB	acres treated	160.71
GSA - IRS New Carrollton	PermPavNoSVNoUDAB	acres treated	3853.65
GSA - IRS New Carrollton	PermPavNoSVNoUDAB	acres treated	3114.21
GSA - NOAA Satellite Operations	BioRetNoUDAB	acres treated	75.07
GSA - NOAA Satellite Operations	BioRetNoUDAB	acres treated	252.7
GSA - NOAA Satellite Operations	VegOpChanNoUDAB	acres treated	639.54
GSA - NOAA Satellite Operations	VegOpChanNoUDAB	acres treated	2141.08
GSA - NOAA Satellite Operations	WetPondWetland	acres treated	288.33
GSA - NOAA Satellite Operations	WetPondWetland	acres treated	965.62
GSA - NOAA Satellite Operations -2	VegOpChanNoUDAB	acres treated	1112.25
GSA - NOAA Satellite Operations -2	VegOpChanNoUDAB	acres treated	2011.86
GSA - Silver Spring Metro Center 1	Filter	acres treated	2030.41
GSA - Silver Spring Metro Center 1	Filter	acres treated	0
GSA - Suitland Federal Center - Census Bureau	BioRetNoUDAB	acres treated	4476.57
GSA - Suitland Federal Center - Census Bureau	BioRetNoUDAB	acres treated	5705.14
GSA - Suitland Federal Center - Census Bureau	BioSwale	acres treated	4130.72
GSA - Suitland Federal Center - Census Bureau	BioSwale	acres treated	5266.71
GSA - US Southern Maryland Courthouse	BioRetNoUDAB	acres treated	791.91
GSA - US Southern Maryland Courthouse	BioRetNoUDAB	acres treated	213.58
GSA - US Southern Maryland Courthouse	PermPavSVNoUDAB	acres treated	2360.54
GSA - US Southern Maryland Courthouse	PermPavSVNoUDAB	acres treated	625.68
GSA - US Southern Maryland Courthouse	SWMEra8502	acres treated	5506.6
GSA - US Southern Maryland Courthouse	SWMEra8502	acres treated	1486.02
GSA - US Southern Maryland Courthouse	Filter	acres treated	236.69
GSA - US Southern Maryland Courthouse	Filter	acres treated	62.65
GSA - Washington National Records	BioRetNoUDAB	acres treated	800.36

GSA

Facility	BMP	Unit	Amount
GSA - Washington National Records	BioRetNoUDAB	acres treated	489.53
GSA - Washington National Records	PermPavSVNoUDAB	acres treated	4763.74
GSA - Washington National Records	PermPavSVNoUDAB	acres treated	2915.12
GSA - Washington National Records	Filter	acres treated	3529.44
GSA - Washington National Records	Filter	acres treated	2155.72
GSA - Washington National Records	VegOpChanNoUDAB	acres treated	3177.27
GSA - Washington National Records	VegOpChanNoUDAB	acres treated	1942.34
GSA - White Oak Research Facility	BioRetNoUDAB	acres treated	4145.63
GSA - White Oak Research Facility	BioRetNoUDAB	acres treated	5836.24
GSA - White Oak Research Facility	BioRetUDAB	acres treated	3982.81
GSA - White Oak Research Facility	BioRetUDAB	acres treated	5606.81
GSA - White Oak Research Facility	Filter	acres treated	3353.08
GSA - White Oak Research Facility	Filter	acres treated	4722.15
GSA - White Oak Research Facility	VegOpChanNoUDAB	acres treated	318.95
GSA - White Oak Research Facility	VegOpChanNoUDAB	acres treated	449.81

DOD

Facility	BMP	Purpose of BMP	Feet of Stream Restoration	IMP_ACRES	URBAN_ACRES
Joint Base Andrews	ESD Practice	REDE	Not Provided	Not Provided	Not Provided
Joint Base Andrews	ESD Practice	REDE	Not Provided	Not Provided	Not Provided
Joint Base Andrews	ESD Practice	REDE	Not Provided	Not Provided	Not Provided
Joint Base Andrews	ESD Practice	REDE	Not Provided	Not Provided	Not Provided
Joint Base Andrews	ESD Practice	REDE	Not Provided	Not Provided	Not Provided
Joint Base Andrews	ESD Practice	NEWD	Not Provided	Not Provided	Not Provided
Joint Base Andrews	Water Quality Improvement Project	Not Provided	Not Provided	Not Provided	Not Provided
Joint Base Andrews	Water Quality Improvement Project	Not Provided	Not Provided	Not Provided	Not Provided
Joint Base Andrews	Water Quality Improvement Project	Not Provided	Not Provided	Not Provided	Not Provided
Aberdeen Proving Ground	Non-structural BMP	REF	Not Provided	0.14	0.85
Aberdeen Proving Ground	Non-structural BMP	REF	Not Provided	0.06	0.49
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.4	0.77
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.34	0.72
Aberdeen Proving Ground	Non-structural BMP	NEWD	Not Provided	0.03	0.99
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.71	1.0
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.11	0.41
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.11	0.23
Aberdeen Proving Ground	Non-structural BMP	NEWD	Not Provided	0.02	0.21
Aberdeen Proving Ground	ESD Practice	REDE	Not Provided	0.4	4.05

DOD

Facility	BMP	Purpose of BMP	Feet of Stream Restoration	IMP_ACRES	URBAN_ACRES
Aberdeen Proving Ground	Non-structural BMP	REF	Not Provided	0.01	4.23
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.35	0.43
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.17	1.41
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.17	1.41
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.17	1.54
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.77	1.87
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	4.11	4.55
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	2.24	4.22
Aberdeen Proving Ground	Non-structural BMP	NEWD	Not Provided	0.28	0.28
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.75	2.01
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.16	1.41
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.16	1.41
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.14	1.38
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.9	1.1
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	3.2	3.8
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.14	0.28
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.29	0.43
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.16	0.37
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.22	0.68

DOD

Facility	BMP	Purpose of BMP	Feet of Stream Restoration	IMP_ACRES	URBAN_ACRES
Aberdeen Proving Ground	Non-structural BMP	NEWD	Not Provided	0.16	0.16
Aberdeen Proving Ground	Non-structural BMP	NEWD	Not Provided	0.35	0.35
Aberdeen Proving Ground	ESD Practice	REDE	Not Provided	0.61	1.5
Aberdeen Proving Ground	Non-structural BMP	REF	Not Provided	3.58	14.07
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	0.66	2.04
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.36	3.2
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.35	3.24
Aberdeen Proving Ground	ESD Practice	NEWD	Not Provided	1.35	3.2
Adelphi Laboratory Center	Water Quality Improvement Project	Not Provided	Not Provided	Not Provided	Not Provided
Adelphi Laboratory Center	Water Quality Improvement Project	Not Provided	Not Provided	Not Provided	Not Provided
Fort Detrick	BMP	Not Provided	Not Provided	Not Provided	Not Provided

DOD

Facility	BMP	Purpose of BMP	Feet of Stream Restoration	IMP_ACRES	URBAN_ACRES
NAS Patuxent River	Water Quality Improvement Project	NRP	600	Not Provided	Not Provided
NAS Patuxent River	Water Quality Improvement Project	NRP	758	Not Provided	Not Provided
NAS Patuxent River	Water Quality Improvement Project	NRP	800	Not Provided	Not Provided
NAS Patuxent River	Water Quality Improvement Project	NRP	1335	Not Provided	Not Provided
NSA Annapolis	BMP	Not Provided	Not Provided	Not Provided	Not Provided
NSA South Potomac - Indian Head	BMP & Water Quality Improvement Project	Not Provided	Not Provided	Not Provided	Not Provided
Solomon's Island	Water Quality Improvement Project	NRP	800	Not Provided	Not Provided
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	Other Practice	REF	Not Provided	Not Provided	0.046
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	Other Practice	REF	Not Provided	Not Provided	0.046
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	BMP	REF	470	Not Provided	Not Provided
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	Other Practice	REF	Not Provided	Not Provided	0.046
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	Other Practice	REF	Not Provided	Not Provided	0.046
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	BMP	REF	470	Not Provided	Not Provided
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	Other Practice	REF	Not Provided	Not Provided	0.046
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	Other Practice	REF	Not Provided	Not Provided	0.046
U.S. Naval Research Laboratory - Chesapeake Bay Detachment	BMP	REF	470	Not Provided	Not Provided
Webster Field OLF	Water Quality Improvement Project	NRP	764	Not Provided	Not Provided

NASA GSFC

Facility	BMP	ImpAcres	TotalAcres Treated	RunoffStorageVolume (CF Treated)
NASA Goddard Space Flight Center	BioRetUDCD	3.83	3.27	20,716