Montgomery County, MD

The Municipal Separate Storm Sewer System Permit (MS4)

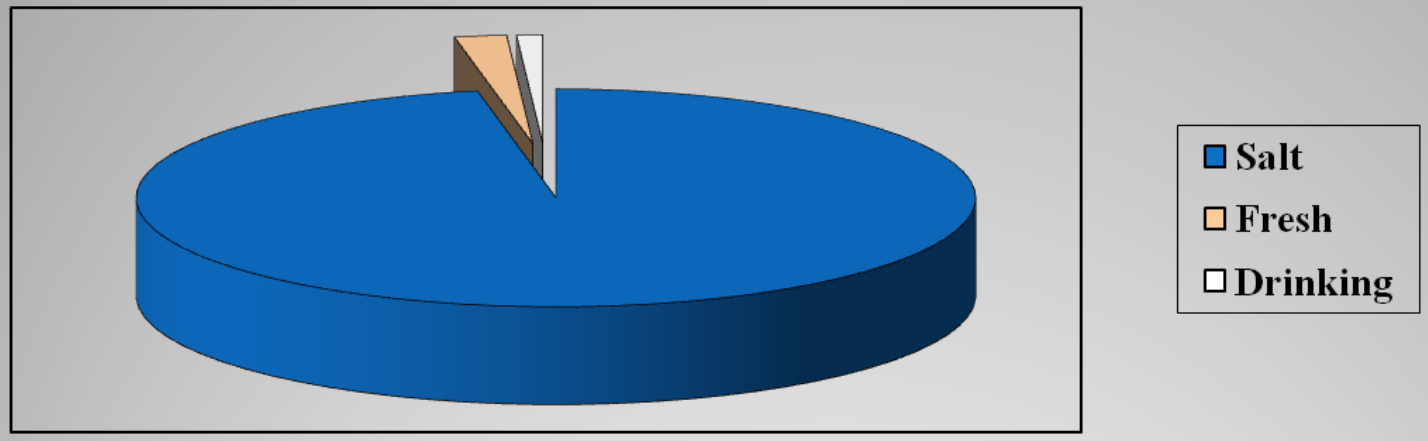
Turkey Branch, Rock Creek

Pam Parker, Senior Planner Stormwater Permit Coordination Watershed Management Division

Presentation Outline

- Background
- Municipal Separate Storm Sewer System (MS4) Permit
- Progress
- Challenges

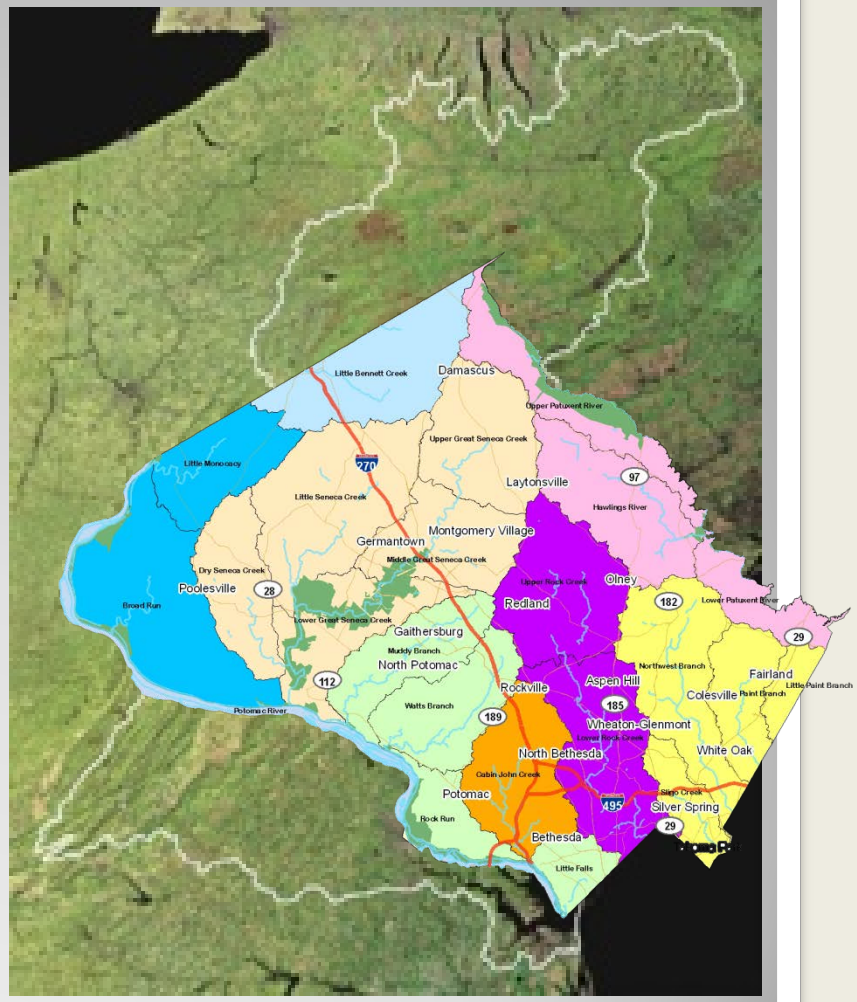
Sources of Water



- About 97% is salt water
- About 2% is frozen
- Only 1% is available for drinking water
  - Across the Country, about 57% comes from surface water sources
  - In Maryland, 74% is from surface water sources
- Potential for greater impacts from runoff in Maryland

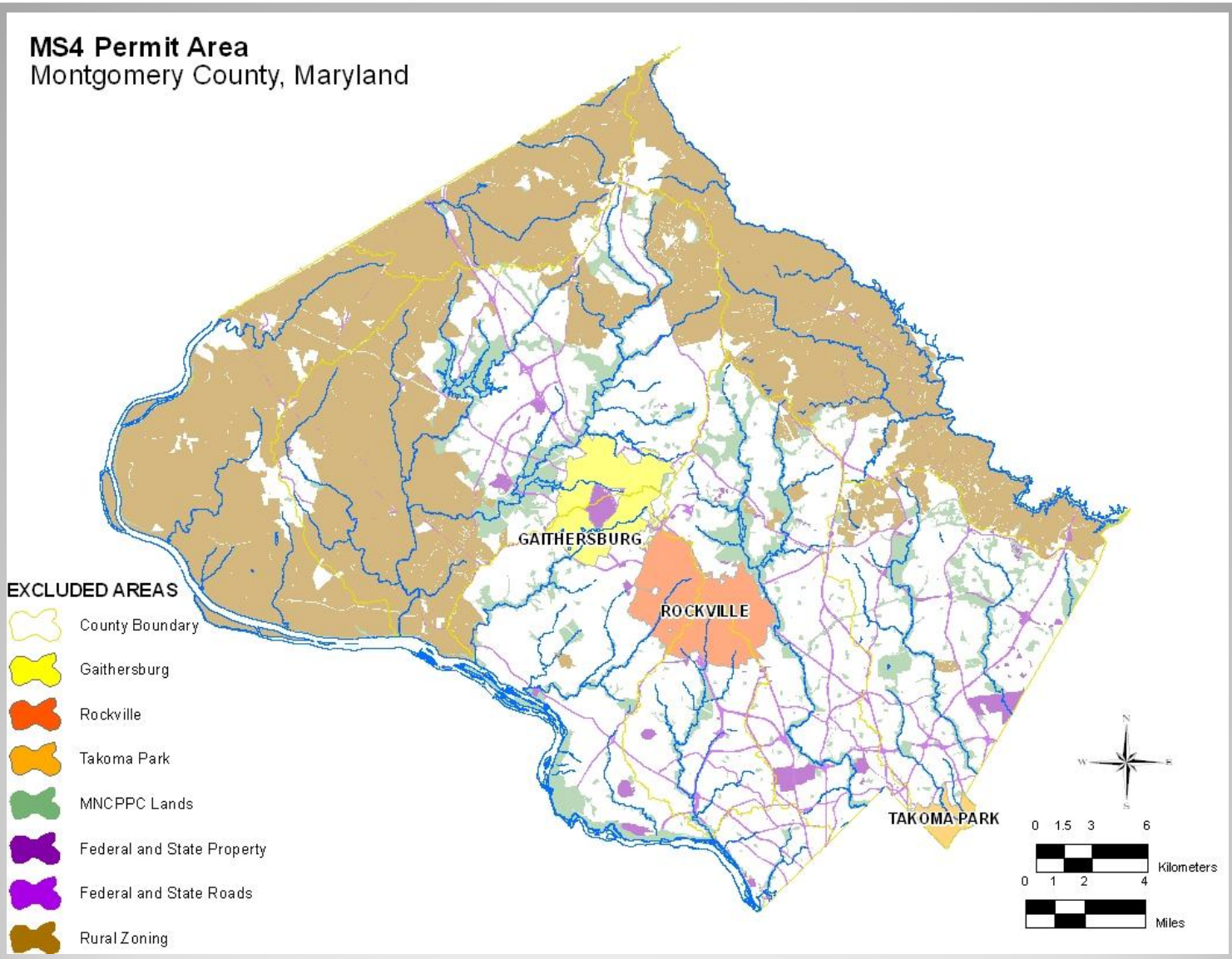
Montgomery County, MD

- 500 sq. miles; 1,000,000 people
- About 12% impervious overall
  - Equal to Area of Washington, DC
- Second only to Baltimore City within Maryland in average people per sq mi
- > 95% of land zoned for development is developed
- Two major basins: *Potomac and Patuxent*
- Eight major watersheds
- At least 184 languages spoken, top 5 non-English are:
  - Spanish, Chinese (Mandarin), Korean, Vietnamese, Amharic (Ethiopia)



Municipal Separate Storm Sewer System (MS4) Permit

- Federal Clean Water Act NPDES
- First issued by Maryland Department of the Environment to Montgomery County in 1996
- Five-year permit term
- 9 other jurisdictions and SHA also covered
- Applies to County and co-permittees
  - Does not include the cities of Gaithersburg, Rockville, and Takoma Park
  - Does not cover lands under the control of State (including M-NCPPC and WSSC) or Federal agencies.
- Third round re-issuance due in July 2006
- MDE worked with regional environmental groups since 2005 on Permit changes
- Issued February 16, 2010


MS4 Permit Area
Montgomery County, Maryland
GAITHERSBURG
ROCKVILLE
TAKOMA PARK
EXCLUDED AREAS
County Boundary
Gaithersburg
Rockville
Takoma Park
MNCPPC Lands
Federal and State Property
Federal and State Roads
Rural Zoning
0 1.5 3 6
Kilometers
0 1 2 4
Miles

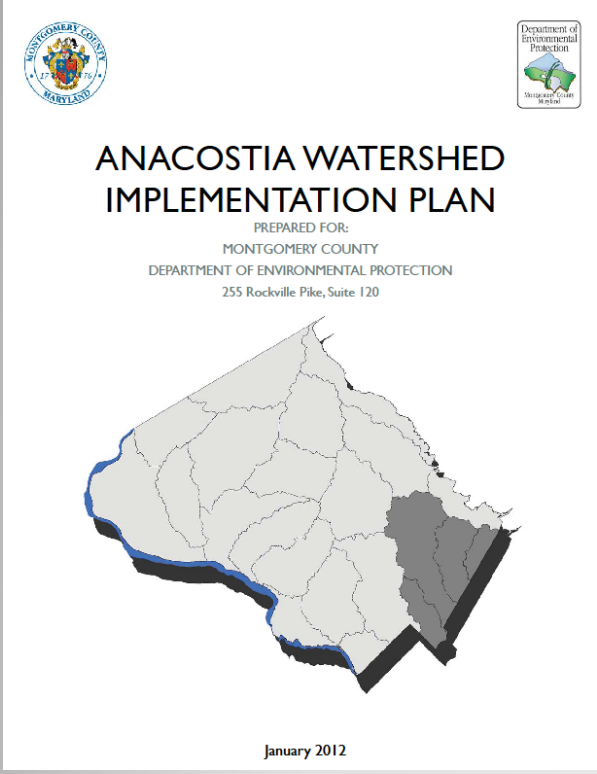
Summary of Significant MS4 Permit Requirements

- ***Watershed Assessment :*** Conduct a systematic assessment of water quality within all County watersheds
- ***Watershed Restoration:*** Implement restoration projects to add runoff management to developed areas. Requires control of 20% of County's untreated impervious area.
- ***Water Quality:*** Implement projects to make progress toward achieving wasteload allocations (WLAs) for Total Maximum Daily Loads (TMDLs), including trash reduction
- ***Implementation Strategy:*** Develop coordinated implementation plans within one year to meet Permit requirements, including TMDL WLAs, impervious area SWM control, trash reduction, and public outreach and stewardship plan
- ***Accountability:*** Track and report progress toward meeting Permit requirements

Other MS4 Permit Requirements

- ***Source Identification- GIS***
  - Storm drains,
  - Urban BMPs- locations and drainage areas
  - Impervious surfaces
  - Watershed restoration project locations and drainage areas
- ***Management Programs***
  - SWM- Plan review, maintenance and inspection
  - ESC
  - Illicit discharge detection and elimination (IDDE)
  - Trash Management and Litter reduction
  - Property management at County facilities
  - Road maintenance
  - Public education
- ***Assessment of Controls***
  - Monitoring – Chemical, physical and biological

Watershed Assessment



Conduct assessments of all watersheds to:

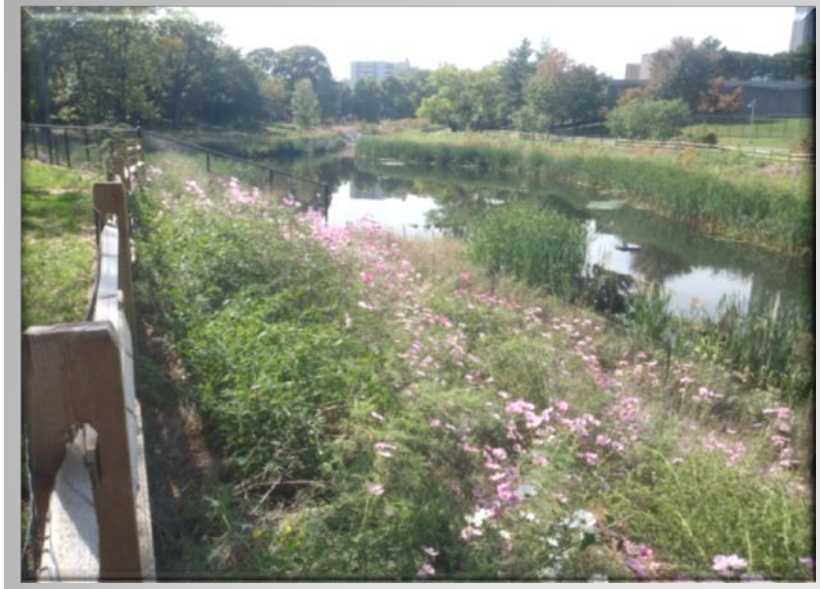
- Determine water quality conditions
- Identify and rank water quality problems and improvement opportunities
- Specify how restoration efforts will increase progress towards meeting TMDLs
- Specify how restoration efforts will be monitored
- Provide information on cost, a detailed implementation schedule, and benchmarks for pollutants load reductions
- Include a public information component

Watershed Restoration

- Requires additional stormwater management to the maximum extent practicable (MEP) for **20 percent** of impervious surfaces not currently treated
  - Almost 20,000 acres un or undercontrolled
  - Impervious control goal is 3,976 acres by 2015
  - Structural and Non structural restoration projects

That's equivalent to 3,007 football fields!

Watershed Restoration
'Structural' Stormwater Management
Retrofit Opportunities



New SWM Pond, NIH, Treated 112 Impervious Acres

Dry Pond Converted to a Wet Pond. Peppertree Farms. Treated 38.4 Impervious Acres

Non-Structural Retrofits

Environmental Site Design (ESD)

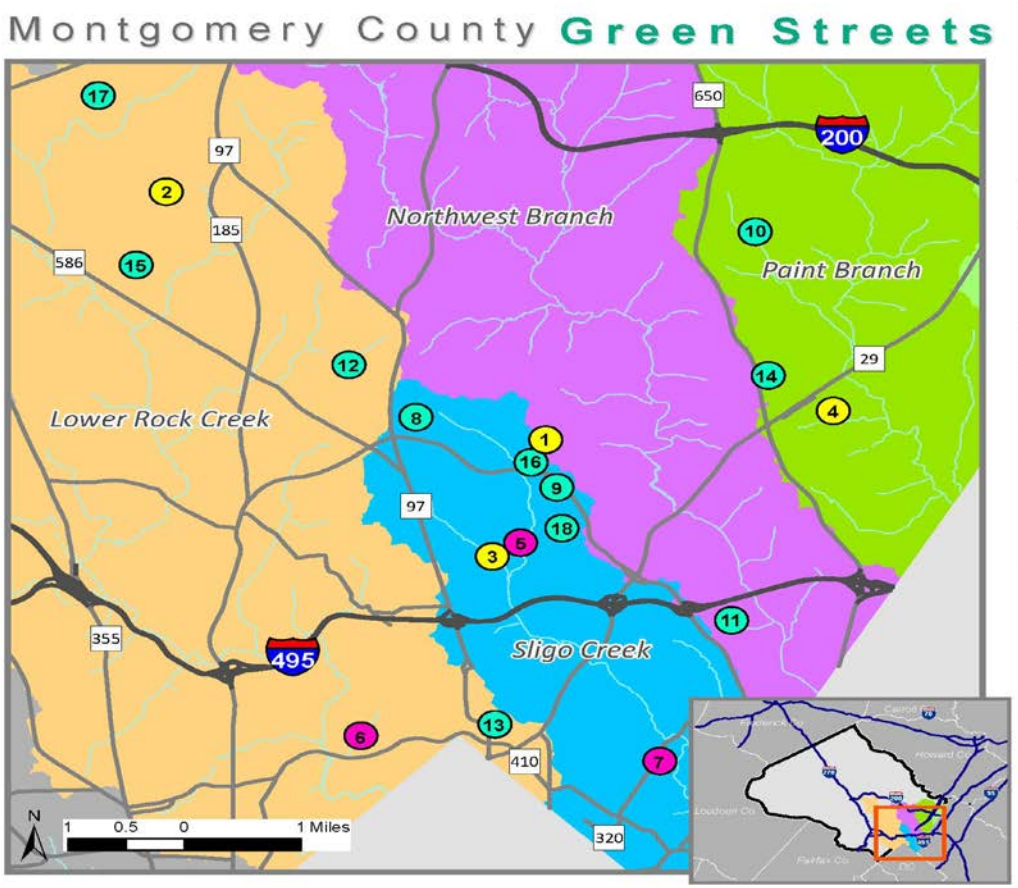
- Small scale practices to capture stormwater runoff close to the source
- Slows down the rate of runoff
- Reduces the overall volume of runoff
- Provides filtration to remove pollutants from stormwater runoff
- Allows stormwater to soak into the ground, replenishing groundwater
- Public properties: Green Streets, Libraries
- Private Properties: RainScapes

Bioretention in the Right of Way, Sligo Park Hills

Curbside Extension

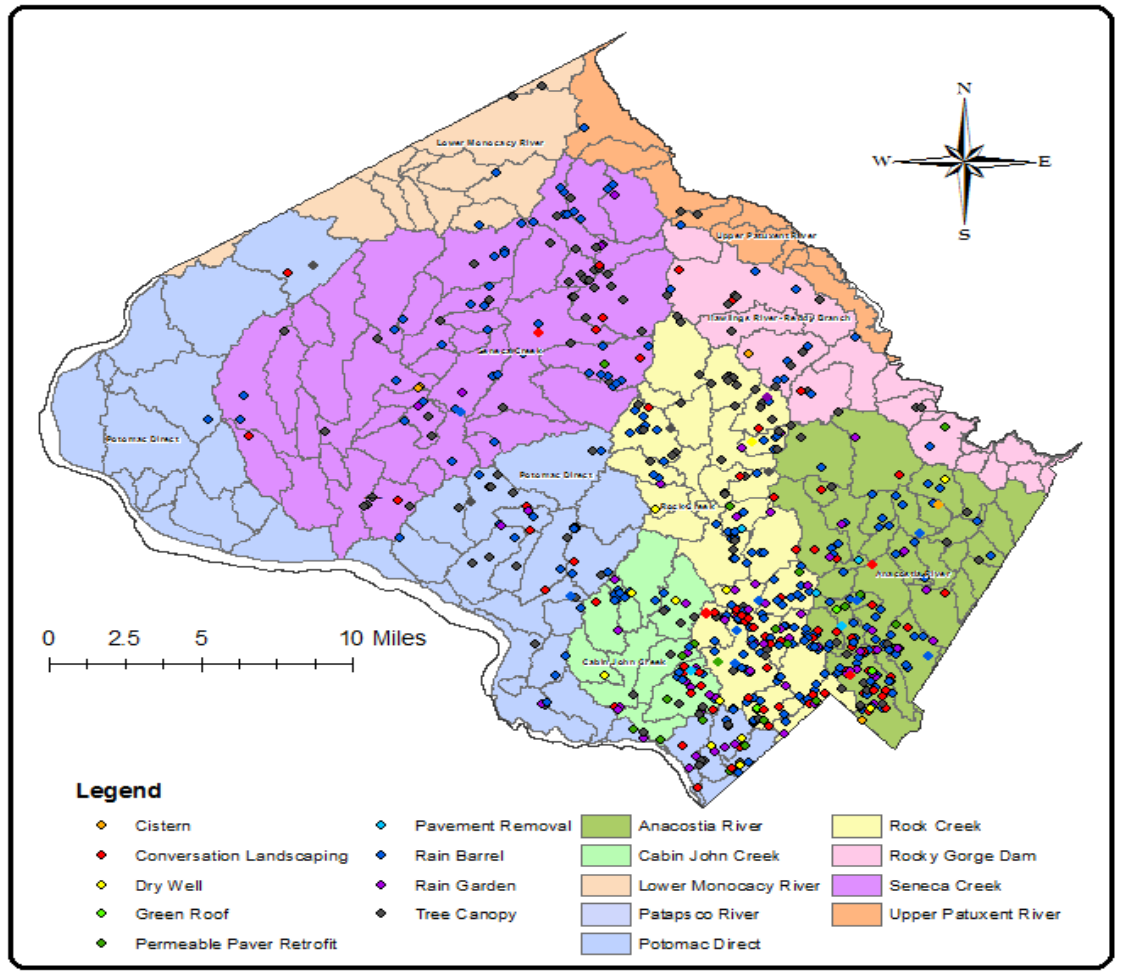
Bioswale

ESD on Public Property: Green Streets Projects



	COMPLETE
1	Arcola Avenue
2	Aspen Hill Library
3	Forest Estates
4	White Oak
	IN CONSTRUCTION
5	Dennis Avenue
6	Donnybrook
7	Sligo Park Hills
	IN DESIGN
8	Amherst
9	Breewood
10	Cannon Road
11	Franklin Knolls and Clifton Park
12	Glenmont Forest
13	Spring Street and Second Street
14	Springbrook \ Homestead Estate
15	Wheaton Woods
16	University Towers
17	Manor Woods
18	McDonald Knolls \ Ballantrae\Sligo Estates

ESD on Private property: Rainscapes Projects



- Rain gardens
- Conservation landscapes
- Urban tree canopy

Stream Restoration

Manage runoff to reduce flow impacts to stream channel and banks and return stream biological and physical function

Rock Creek- Turkey Branch

Before – Stream Bank Erosion

After restoration

Programmatic Watershed Restoration Practices

- Public Education and Outreach-
  - Anti-Litter/Trash Reduction and Recycling
    - County Solid Waste Services
    - Other County Programs
    - Regional Trash Reduction goals
  - H2O Summit- with WSSC
  - Pet Waste Reduction Pilot
  - Stream Stewards
  - Storm Drain Marking/Storm Drain Art
- Streetsweeping
- Stormwater Pollution Prevention at County Facilities

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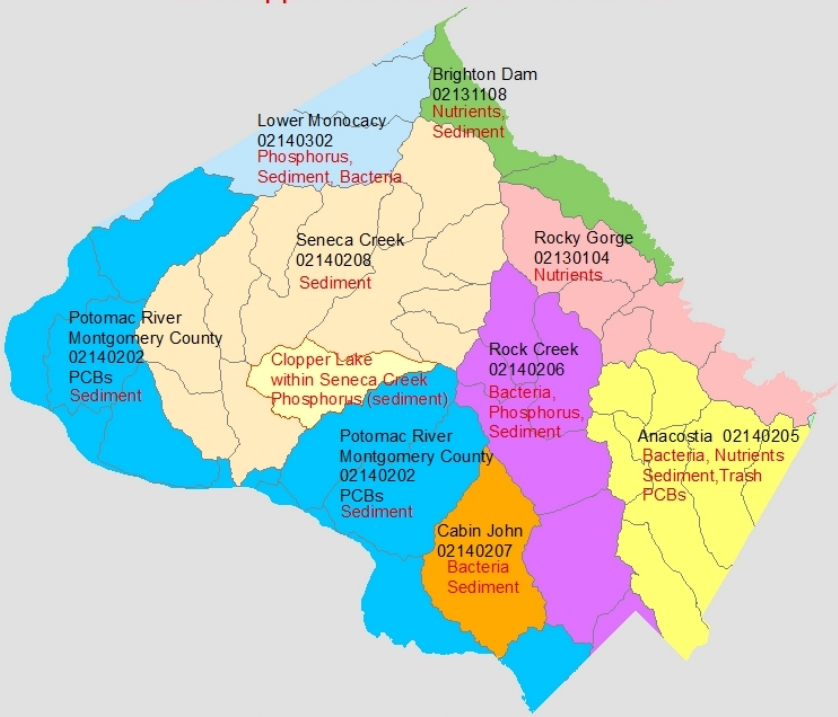
Meeting Water Quality Requirements

Eight 8-digit watersheds

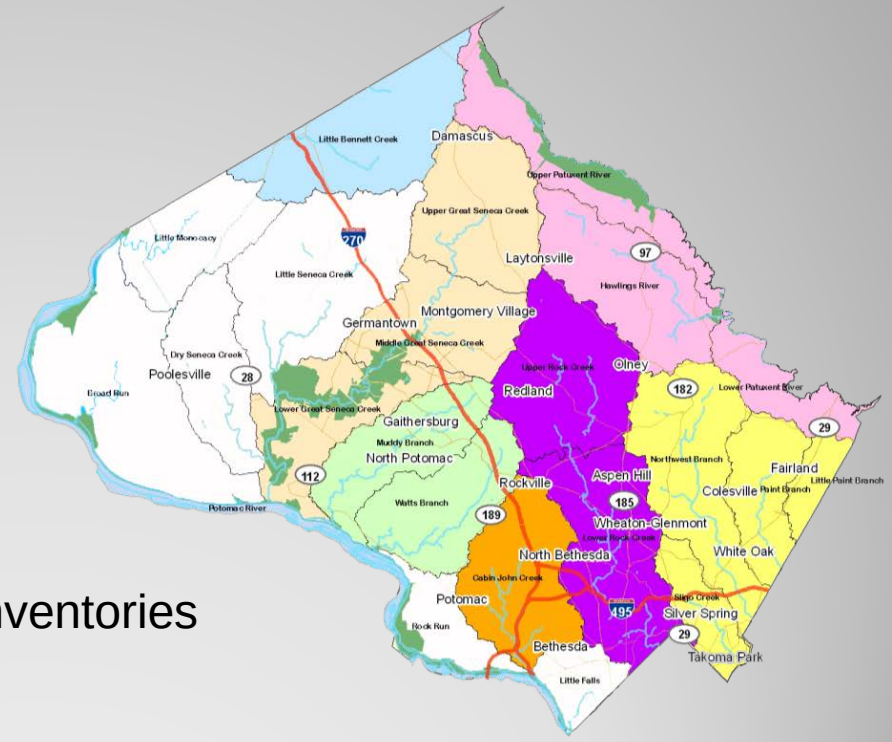
Many TMDLs

Determined from different data sources from different base years

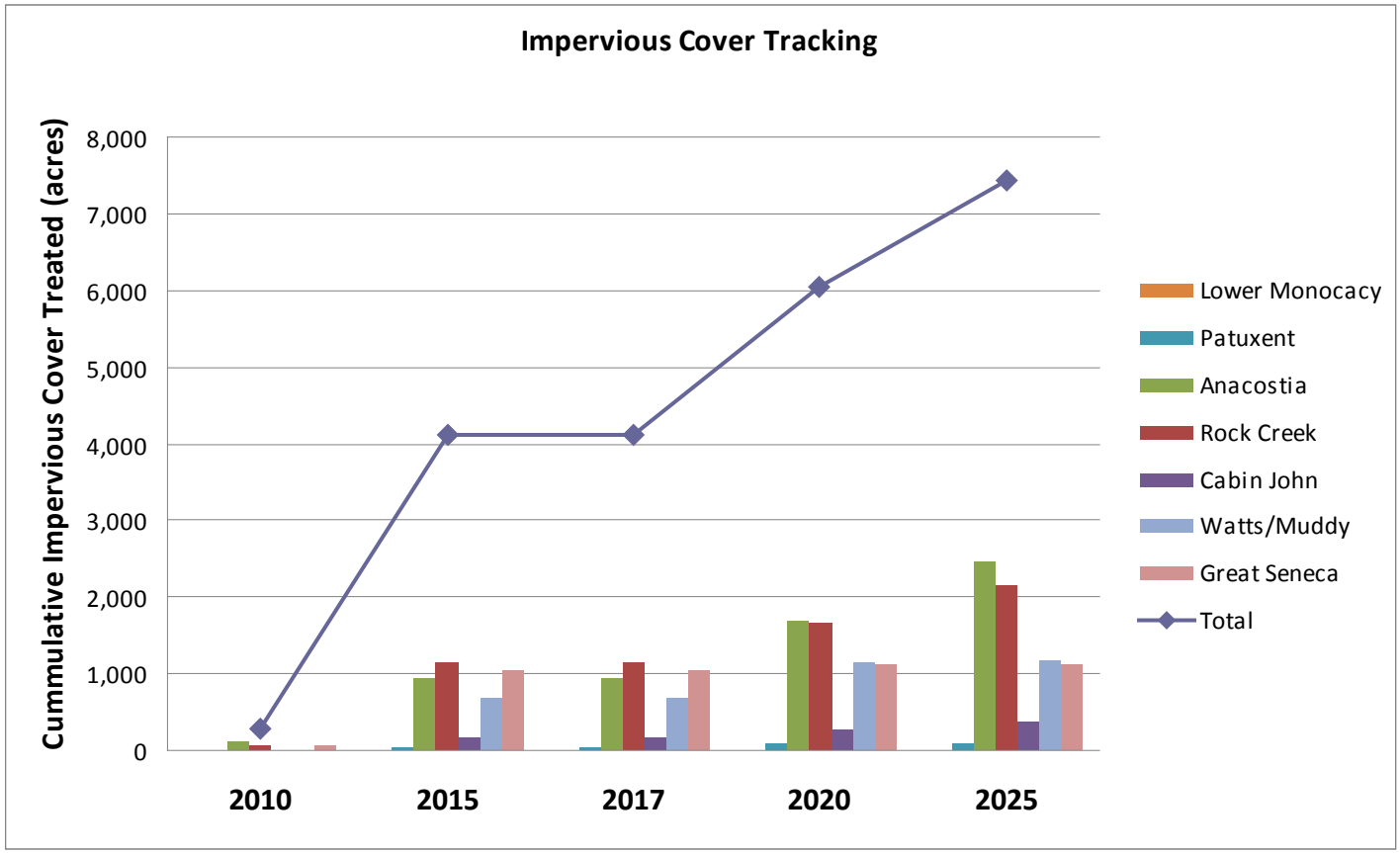


Countywide Coordinated Implementation Strategy

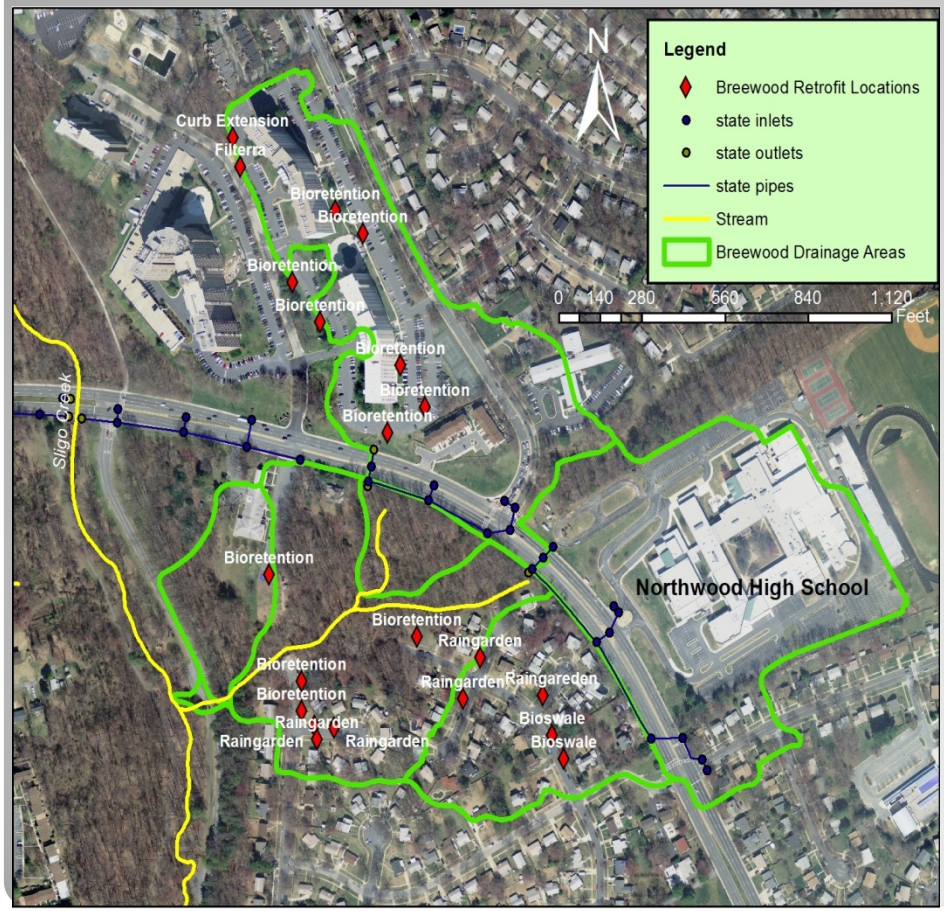
- Meet MS4 permit goals
  - Impervious area control
  - TMDLs
  - Trash reduction workplan
  - Public education and outreach
- Watershed Implementation Plans
  - EPA-approved local TMDLs
  - Existing watershed restoration inventories
- Submitted to MDE in February 2011



Countywide Implementation Strategy Impervious Restoration Goal

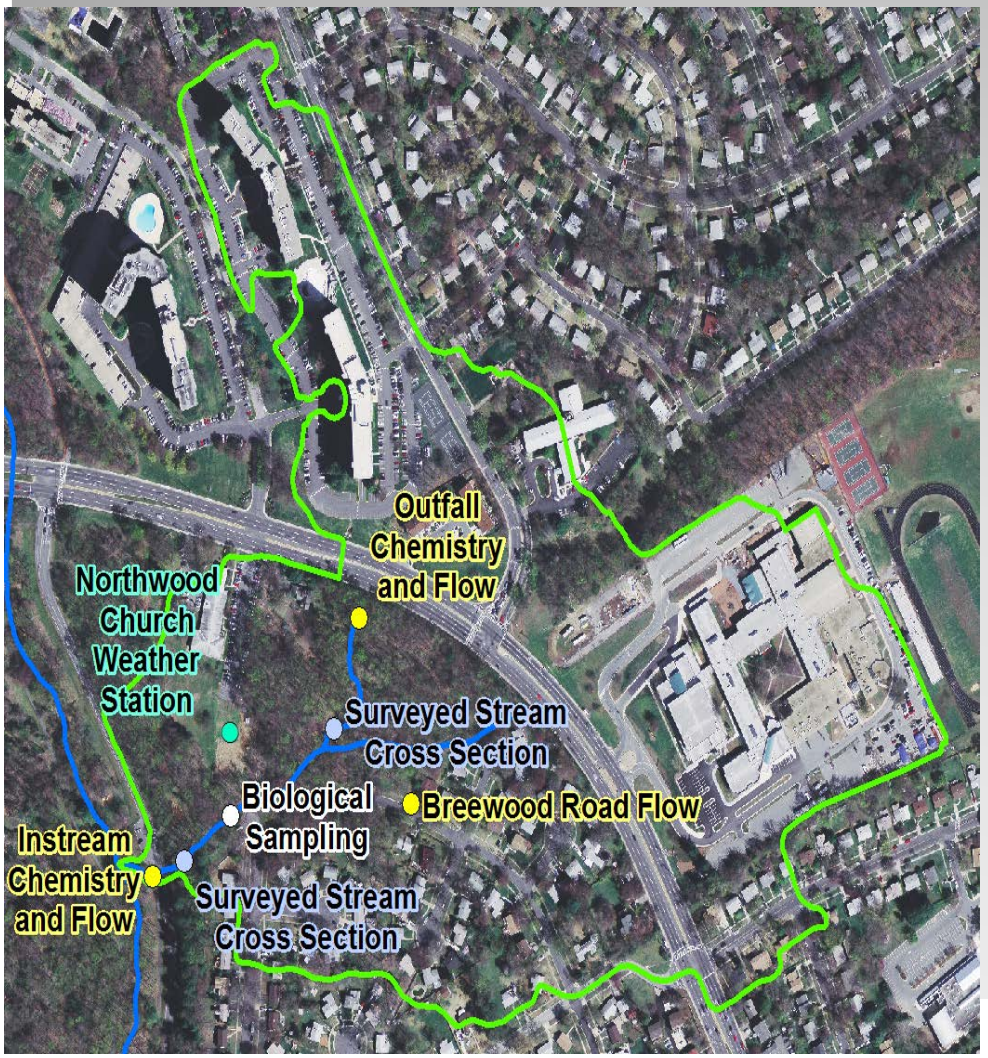


Monitoring Requirements: Breewood Tributary Restoration



- Approximately 60 acres
- 33% imperviousness
- Mixed Use – Single Family Homes and
  High Rise Apartments
- Retrofits
  - Green Streets Stormwater Retrofits
  - RainScapes Neighborhood
  - Parking lot and tree box retrofits
  - Stormwater Wetland Retrofit-OF
- Stream Restoration
- Environmental Outreach and Litter Reduction
- Local Park Improvement – Weed Warriors

Breewood Tributary Monitoring



One outfall and instream monitoring station- water chemistry and flow

Two stream geomorphology stations

One biological monitoring station

Weather station (rainfall)

Continuous physical water chemistry monitoring (new)

Two additional stations to monitor pre and post retrofit (RainScapes Neighborhoods) water quality and flow.

Progress

- Improving Data- Drainage Areas, Impervious, Storm Drain
- Stormwater Quality Improvement Related Regulations
  - SWM and ESC regulations to comply with the State's Stormwater Management Act of 2007
  - Zoning Code Rewrite Completed- Removing Barriers to ESD in County Codes
  - Water Quality Protection Charge update- Comply with 2012 HB987
  - Ban of Coal Tar sealants
  - Bag Bill
- Incorporating ESD practices into the Stormwater Facility Maintenance and Inspection Program.

Progress

- Revised County Facility Pollution Prevention Plans and applied for Notice of Intent for new stormwater general NPDES Permit.
- Enhanced Streetsweeping Program
- Enhanced IDDE Program and comprehensive enforcement program
- Greatly expanded the Outreach program
- Adopted Carryout Bag Law to reduce litter in streams

Progress

- Watershed Implementation Plans for all watersheds will be completed in FY15
- Impervious area restoration
  Through FY13 have restored 548 acres of uncontrolled IA with additional projects that will treat 185 acres under construction. Projects under design in FY13 will add control to an additional projected 2,425 acres.
- The above accounts for 3,158 impervious acres. Permit requires restoration of 3,976 impervious acres
- Many, many additional projects identified for future development.

Challenges

- Watershed Restoration and Implementation Challenges
  - Time required to ramp up Implementation rate
  - Personnel required – obtaining contractual support
  - Length of time to obtain required permits
  - Identifying retrofit opportunities in already developed residential areas with limited publicly available land
  - Utility Constraints
  - Property owner Buy-In

Challenges

- Lack of Accounting Guidance During Strategy Development
  - For progress towards meeting Stormwater Wasteload Allocations (SLAs)
  - Impervious acres treated, defining MEP
- Data Challenges
  - Updating, improving and integrating data developed for different needs

Challenge: Meeting TMDL WLAs

TMDL Summary by Impairment

Impairment	Watershed	Percent Reduction Since Baseline Date*
Bacteria	Cabin John Creek	0.40%
	Rock Creek	3.50%
	Anacostia River	4.80%
	Lower Monocacy River	0.02%
Sediments	Anacostia River	3.10%
	Triadelphia Reservoir	0.02%
	Clopper Lake	0.00%
	Lower Monocacy River	0.10%
	Seneca Creek	1.00%
	Rock Creek	7.26%
	Cabin John Creek	1.80%

TMDL Summary by Impairment

Impairment	Watershed	Percent Reduction Since Baseline Date*
Nutrients	Clopper Lake	0.00%
	Anacostia River	5.90%
	Anacostia River	6.40%
	Triadelphia Reservoir	0.30%
	Rocky Gorge Reservoir	0.23%
	Lower Monocacy River	
	Rock Creek	0.98%
Trash	Anacostia River	4.60%
PCB	Anacostia River- Non Tidal-NWB	
PCB	Anacostia River- Non Tidal-NEB	

Challenge: Costs

Table IV.C6- Department of Environmental Protection Approved (May 2012) FY13-18 Stormwater Management (SWM) Capital Improvement Program Budget (in $000s)							
Projects	**CIP Cycle Total**	**FY13**	**FY14**	**FY15**	**FY16**	**FY17**	**FY18**
Total	**235,000**	**25,000**	**35,000**	**40,000**	**40,000**	**45,000**	**50,000**

Table IV.C8- Total Funding for County MS4 Related Programs By Fiscal Year (in 000s). **(excluding DOT and DGS Operational Property Management and Pollution Prevention)**				
Fiscal Year (FY):	FY0	FY11	FY12	FY13
Total Budgeted	$27,415	$30,097	$30,302	44,773
Increase between fiscal years		9.7%	.70%	48%

Continuing Challenges

- Financial- Cost to install ESD retrofits currently about $200,000 an acre
  - Greatest runoff and pollutant reductions per acre
  - Small amount of acres controlled per project
- How do we measure outreach success?
- Legal Challenges- future changes in the MS4 permitting program?

Third Generation of MS4 Permits

- First third generation permit issued on February 16, 2010 to Montgomery County. The Permit was challenged by Earth Justice. Earth Justice was given standing and judicial review has remanded Montgomery County permit from 2010 back to MDE . MDE is currently appealing.
- Baltimore City, Baltimore County, Prince George's County, and Anne Arundel County third generation permits issued December 2013-February 2014. All have been challenged by environmental groups
- Tentative Determinations issued for all remaining MS4 Phase I Jurisdictions except SHA

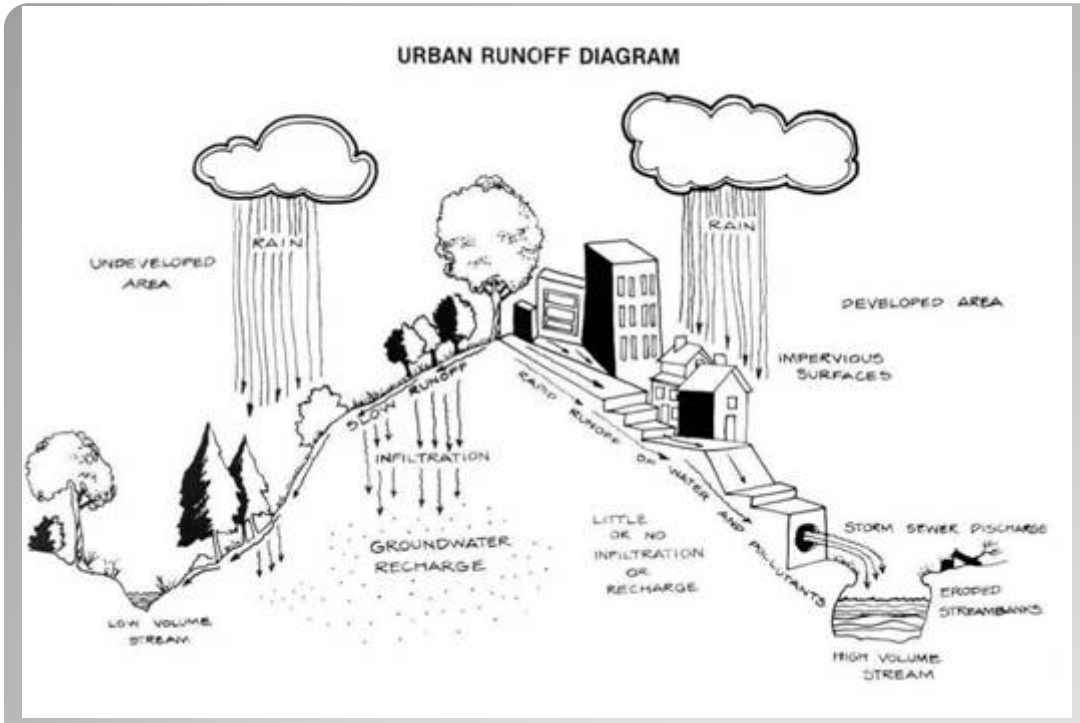
Goal: Streams in Good Condition

Sculpin

Stonefly

Questions?

- Pam Parker
- Pamela.parker@montgomerycountymd.gov
- 240-777-7758



Non-point source Problems

- Increased imperviousness (hard surfaces)
- Increased runoff from storms
- Reduced groundwater recharge (infiltration)
- Streams become “flashy” with higher stormflows and lower baseflows
- Eroded streambanks contribute increased pollutants

In the Chesapeake Bay Watershed, stormwater is the only source of pollution that is increasing (Source: Chesapeake Bay Program)

Stormwater Pollution Control Programs focus on:

- Reducing stormwater volume
- Reducing pollutants in urban runoff
  - Bacteria
    - pet waste, wildlife, and sewer leaks
  - Nutrients
    - fertilizers: nitrogen and phosphorus
  - Sediment
    - erosion
  - Trash
  - Toxics
    - PCBs

85% of trash found in the Anacostia in DC before Bag Bill consisted of plastic bags and soda bottles

Priority: Restore Our Streams

Blacknose Dace

Only organisms tolerant of poor conditions will survive

Black Fly and Chironomid Larvae

Countywide Strategy: Impervious Acres Treated and Pollutant Reductions

Countywide Watersheds

Summary of Implementation Plan schedule with expected MS4 permit area WLA compliance endpoints

	2015	2017	2020	2025	2030	Permit/ TMDL Targets 2017	Permit/ TMDL Targets 2020
Impervious Area Treated (acres)	4,302	6,014	7,722	10,518	11,154	6,008	7,723
% of Impervious Area Treated by ESD	18%	34%	47%	60%	63%		
Impervious Area Treatment Cost (Million $)	305	622	987	1,687	1,884		
% of Cost for ESD	53%	66%	70%	80%	80%		
Nitrogen (% Reduction)	18%	25%	36%	46%	51%	9%	20%
Phosphorus (% Reduction)	17%	23%	34%	44%	46%	12%	34%
Sediment (% Reduction)	23%	34%	54%	60%	62%	20%	37%
Bacteria (% Reduction)	11%	15%	20%	28%	30%		
Trash (% Reduction)	18%	26%	33%	41%	42%		

Assumptions:
1. Does not inclde repeated Outreach and Education costs beyond FY2015
2. Does not include an inflatoin multiplier

Based on State of Maryland 2010 targets to meet 70% implementation by 2017 and 100% implementation by 2020