


Every Drop Counts: The Howard County Watershed Stewards Academy's Work with Public Stakeholders to Help Howard County Meet Chesapeake TMDL Goals

Terry Matthews, *Howard County Watershed Stewards Academy*
Radhika Wijetunge, *Brown & Caldwell*

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Presentation Outline

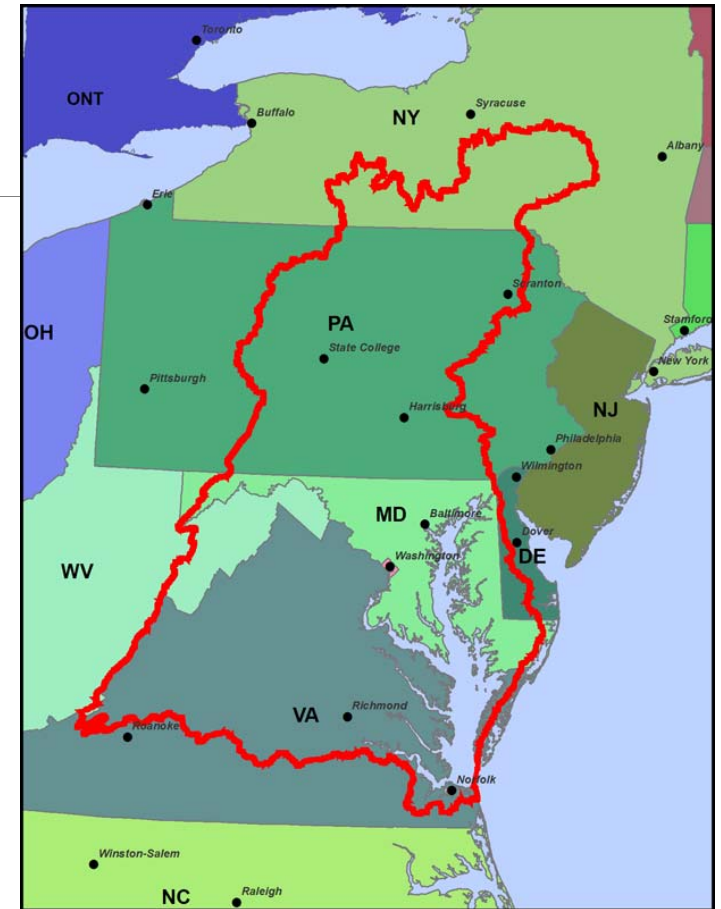
- Background
 - Stormwater Issues in Howard County
 - Howard County TMDL Goals
 - Howard County Watershed Stewards Academy
 - How We Help Meet TMDL Goals
 - Questions
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Background

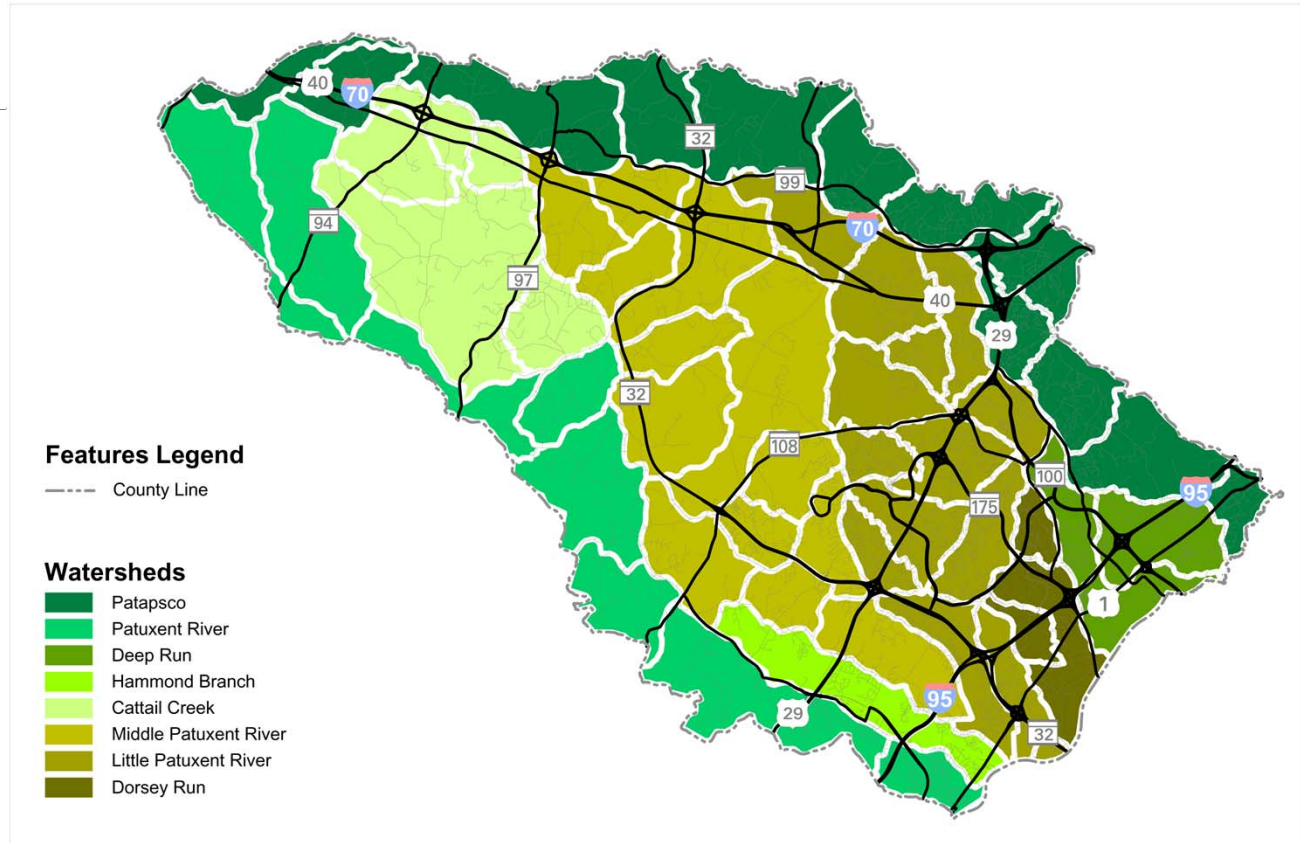
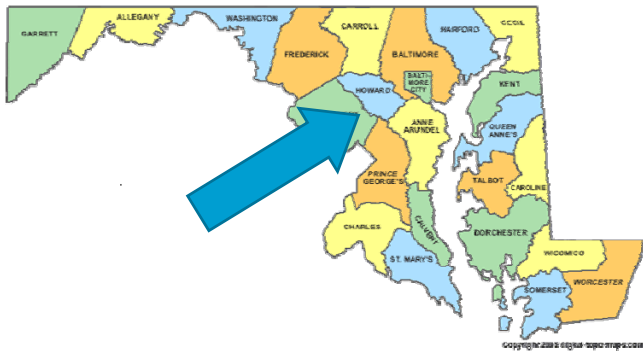


Chesapeake Bay Watershed

- 64,000 square mile watershed
- Spread over 6 states
- Largest US estuary
- 10,000 miles of shoreline
- Home to over 3600 species of plants, fish, and other animals
- Home to 17 million people

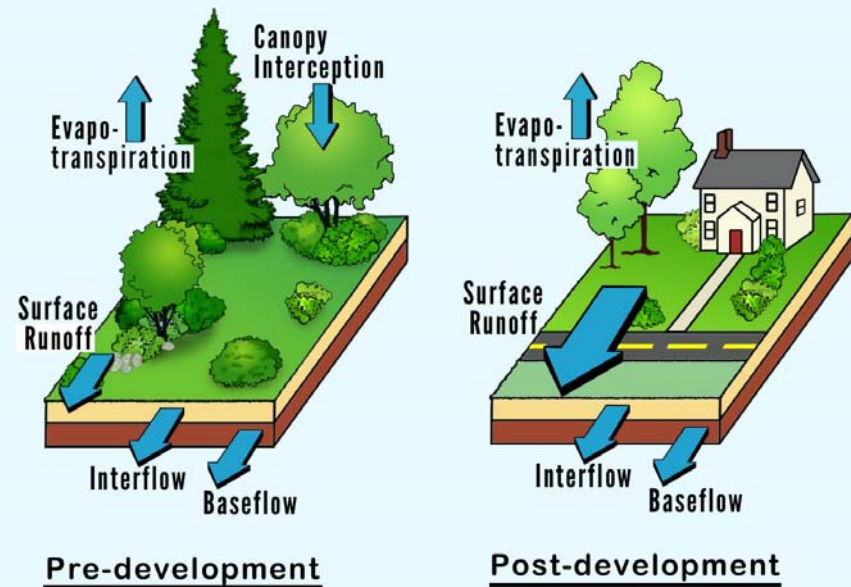


Howard County, Maryland



Water Balance with Development

Figure 1.1 Water Balance at a Developed and Underdeveloped Site
(Source: Schueler, 1987)



Surface runoff is minimal in an undeveloped site, but dominates the water balance at a highly impervious site.

What Typically Happens to All that Rain!



Stormwater Issues in the Chesapeake


- Stormwater runoff is the fastest growing source of pollution to the Chesapeake Bay
- According to the Chesapeake Bay Program's Watershed Model, stormwater contributes
 - 16% of nitrogen loads
 - 16% of phosphorus loads, and
 - 25% of sediment loads that enter the Bay.

Chesapeake Bay TMDL Goals

In 2010, Bay watershed limits of

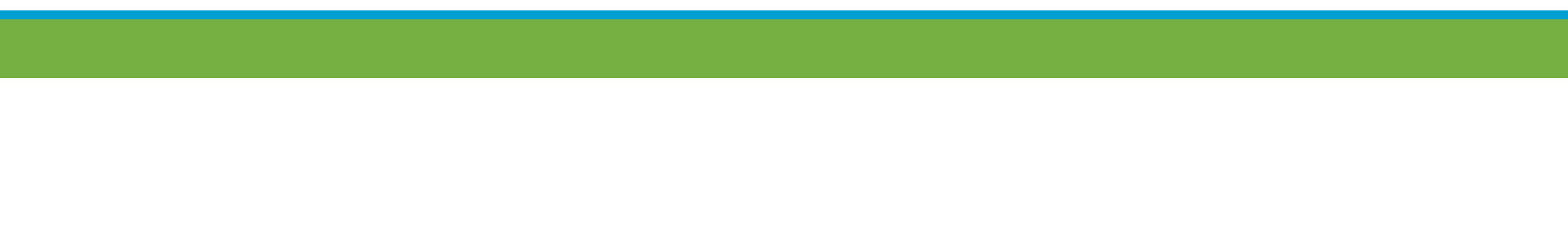
- 185.9 million pounds of nitrogen,
- 12.5 million pounds of phosphorus, and
- 6.45 billion pounds of sediment per year

Which translates to:

- 25% reduction in nitrogen,
 - 24% reduction in phosphorus and
 - 20% reduction in sediment
- 

Howard County TMDL Goals

Howard County's Stormwater Permitting History

- Howard County is classified as a medium municipality, and owns and operates a storm sewer system.
 - The County's initial permit was issued in April 1995
 - Howard County submitted its Phase II Watershed Implementation Plan (WIP) for the Chesapeake Bay TMDL in November 2011
 - Revised WIPs were submitted in July, 2012 and December 2014.
- 

Countywide Implementation Strategy

- Establishes ways to meet the Total Maximum Daily Load (TMDL) Stormwater Wasteload Allocations (SW-WLAs)
- Finds strategies to provide additional stormwater runoff management for impervious acres equal to 20% of the impervious area for which runoff is not currently managed to the Maximum Extent Practicable (MEP)
- **Educates and involves residents, businesses, and stakeholders in achieving measurable water quality improvements**
- Establishes a reporting framework for annual reporting under the County's MS4 permit
- Provides an evaluation and adaptive management process for developing actions to be taken if permit requirements are not met
- Identifies the funding needed to implement the CIS

Stormwater Issues in Howard County

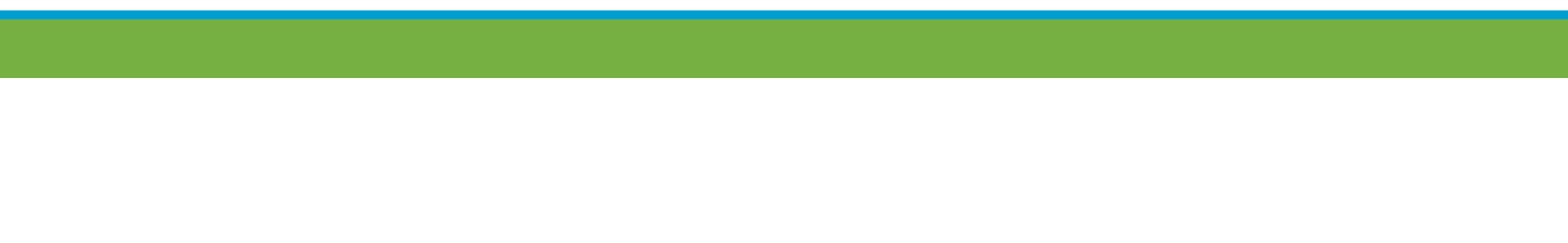


How much water falls during a storm?

- In a year, the Howard County area gets 40 - 45 inches of rain
- Say a house has a roof that is 30 ft. by 30 ft. or 900 sq. ft. Then an **inch** of rain falling on that roof and rolling down the downspouts would equal 561 gallons, enough for 14 forty-gallon baths.



Public vs Private Property

- Howard County has a population over 300,000, with approximately 100,000 people in Columbia alone.
 - More than 60% of land surface is privately owned – and accounts for 70% of the County's impervious cover.
 - There are no incorporated cities, only non-profit community associations (+/-300), and the Columbia Association to manage local populace.
- 

Adaptation of Household Stormwater Best Management Practices – 2013

The majority of households have not adapted these BMPs:

- 2.5% have rain gardens,
 - 7.6% have rain barrels,
 - 23.4% use low fertilizer lawn care, and
 - 10.2% use conservation landscaping,
- suggesting the need for more education and use of these BMPs.

Over half of the respondents (57%) indicated that they would be willing to put in rain gardens either at their own cost (30%) or with a rebate (70%).

Of those not choosing to have a rain garden, over half (59%) felt that the costs were too high, and almost half (44%) did not feel that they had enough information

Local Perspective

“... Wilde Lake residents, on the other hand, often seemed convinced that their own stormwater soaked in to the ground and did not impact the lake, despite widespread awareness of flash flows of water through adjoining common areas during heavy rainstorms. In fact, across all four groups there was significant uncertainty that one’s own property had much negative impact on water quality in the nearby water body, even though there was a consensus in every focus group that the closest water body was contaminated.”

(OpinionWorks, 2015)



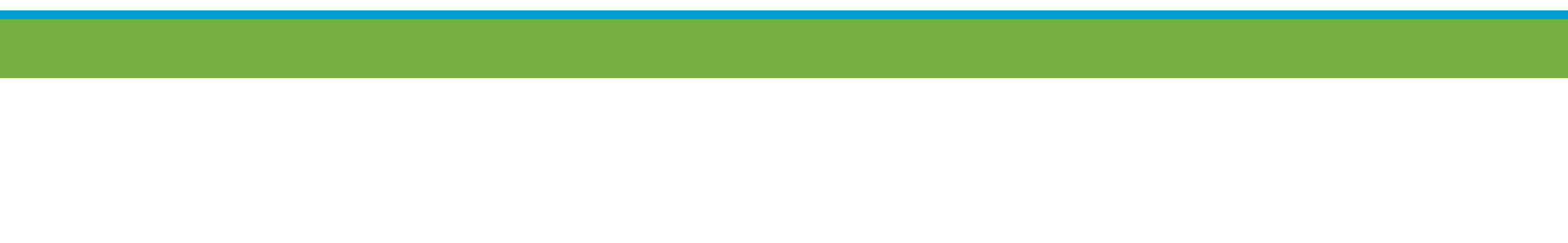
Post Ellicott City Flooding

In November 2016, a survey was conducted, asking residents:

“Who do you think has a responsibility for reducing flooding risk?”

- 80% of participants replied: the people in the area affected (myself, my neighbors)

“What are things I’m ready to commit to doing to help the environment and the rebuilding process?”

- 67% volunteer my time to clean up the streams or storm drains
 - 80% landscape my property to accommodate stormwater
 - 67% install a rain barrel(s) at my home or business
- 

Howard County Watershed Stewards Academy



Howard County Watershed Stewards Academy (HoCoWSA)

The Howard County Watershed Stewards Academy is a training program to empower residents to improve the water quality of local streams. Stewards become community leaders in reducing harmful effects of polluted stormwater running off into our streams.

The Academy provides Stewards

- knowledge and expertise from lecturers,
- training in using watershed assessment tools for analyzing stormwater runoff and
- hands-on experience installing a solution to a stormwater management problem.

A consortium of experienced stormwater management practitioners will provide Stewards with on-going support for their community projects.

Topic	Speaker
Introduction to the Chesapeake Bay Watershed	Ned Tillman, Author of The Chesapeake Watershed
Watershed Science and Land Use Change	Tom Schueler, Executive Director, Chesapeake Stormwater Network
Hands-On Watershed Exercise	Lori Lilly, Watershed Ecologist/Planner, Center for Watershed Protection
Clean Water Act and Mandate to Improve Water Quality of Local Streams	Lee Currey, Director, Science Services Administration, Maryland Department of the Environment
Pollution Sources in Howard County: Overview	Mark Richmond, PE, Chief, Stormwater Management Division, Bureau of Environmental Services, Howard County Dept. of Public Works
Illicit Discharge and Pollution Hot Spots	Angela Morales, Environmental Planner, Stormwater Management Division, Howard County Dept of Public Works
Solving Pollution Problems: Policy and Prevention	Lindsay DeMarzo, Sustainability Project Manager, Howard County Office of Community Sustainability
Pollution Solutions: BMPs for Private Landowners	John McCoy, Watershed Manager, Columbia Association
Rain Barrels and Conservation Landscaping	Amanda Rockler, Regional Watershed Protection Specialist, Sea Grant Extension Program, University of Maryland College Park
Clean Water Howard and its CleanScapes Program	Rachel Beebe, Howard County Office of Community Sustainability
GIS Principles and Utility for Stewards	Robert Slivinsky, GIS Coordinator, Howard County Dept of Communication and Technology Services
Soils	Michael Calkins, Soil Conservation Planner/Stormwater Management Specialist, Howard Soil Conservation District
Successful Community Engagement	Kacey Wetzel, Director of Outreach and Education, Chesapeake Bay Trust



Neighborhood Source Assessment

BENCHMARKS
Neighborhood Source Assessment (Adapted from CWP)

NSA

WATERSHED:	SUBWATERSHED:	UNIQUE SITE ID:
DATE: ___/___/___	ASSESSED BY:	CAMERA ID:
PIC#:		

A. NEIGHBORHOOD CHARACTERIZATION

Neighborhood/Subdivision Name: _____ Neighborhood Area (acres): _____
If unknown, address (or streets) surveyed: _____ Community Marina Y N

Homeowners Association? Y N Unknown If yes, name and contact information: _____

Residential (circle average single family lot size):
 Single Family Attached (Duplexes, Row Homes) <5% 1/4 3/8 1/2 acre Multifamily (Apts, Townhomes, Condos)
 Single Family Detached <1% 1/2 3/4 1 >1 acre Mobile Home Park

Estimated Age of Neighborhood: _____ years Percent of Homes with Garages: _____% With Basements _____% **INDEX:** _____
Percent of Homes with Beats: _____%

Sewer Service? Y N _____ !

Index of Infill, Redevelopment, and Remodeling No Evidence <5% of units 5-10% >10% _____ !

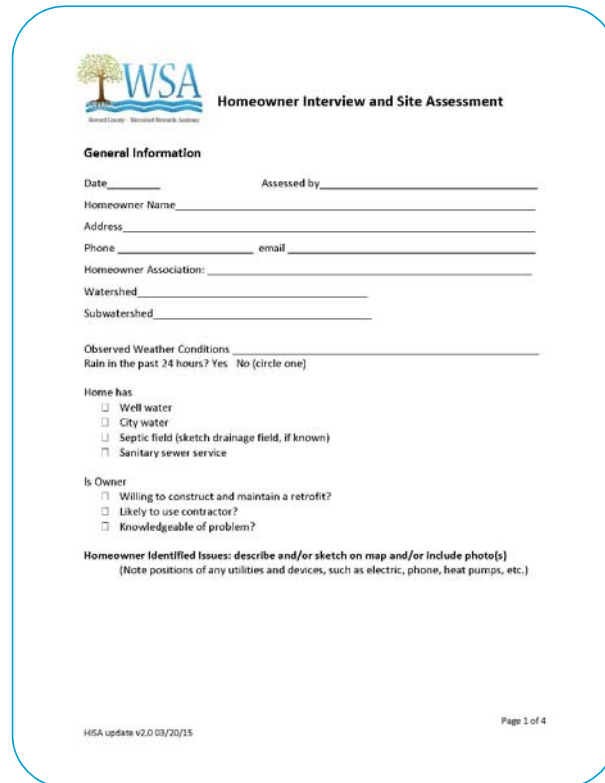
Record percent observed for each of the following indicators, depending on applicability and/or site complexity


Indicator	Percentage	Comments/Notes	INDEX
B. YARD AND LAWN CONDITIONS			
B1. % of lot with impervious cover			!
B2. % of lot with grass cover		>50%	!
B3. % of lot with landscaping (e.g., mulched bed areas)		>25%	!
B4. % of lot with bare soil		>50%	!
*Note: B1 through B4 must total 100%			
B5. % of lot with forest canopy		<40%	!
B6. Evidence of permanent irrigation or "non-target" irrigation		>15%	!
B7. Proportion of total neighborhood turf lawns with following management status:	High: _____	>20%	!
	Med: _____		
	Low: _____		
B8. Outdoor swimming pools? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell Estimated # _____		>10%	!
B9. Junk or trash in yards? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Can't Tell		>25%	!
C. DRIVEWAYS, SIDEWALKS, AND CURBS			
C1. % of driveways that are impervious <input type="checkbox"/> N/A			
C2. Driveway Condition <input type="checkbox"/> Clean <input type="checkbox"/> Stained <input type="checkbox"/> Dirty <input type="checkbox"/> Breaking up		ANY ONE >25%	!
C3. Are sidewalks present? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, are they on one side of street <input type="checkbox"/> or along both sides <input type="checkbox"/>			
<input type="checkbox"/> Spotless <input type="checkbox"/> Covered with lawn clippings/leaves <input type="checkbox"/> Receiving "non-target" irrigation		>25%	!
What is the distance between the sidewalk and street? _____ ft.		>25% w/ > 6ft	!
Is pet waste present in this area? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> N/A		>25%	!
C4. Is curb and gutter present? <input type="checkbox"/> Y <input type="checkbox"/> N If yes, check all that apply:			
<input type="checkbox"/> Clean and Dry <input type="checkbox"/> Flowing or standing water <input type="checkbox"/> Long-term car parking <input type="checkbox"/> Sediment		>25%	!
<input type="checkbox"/> Organic matter, leaves, lawn clippings <input type="checkbox"/> Trash, litter, or debris <input type="checkbox"/> Overhead tree canopy		>25%	!

* INDEX: ! denotes potential pollution source; ↓ denotes a neighborhood restoration opportunity

- Neighborhood Characterization
 - ✓ Lot Size
 - ✓ Type of residence
- Yard and Lawn Conditions
 - ✓ % of lot impervious
- Driveway, Sidewalk, and Curbs
 - ✓ Presence of curb and gutter
 - ✓ Condition of driveway
- Rooftop
 - ✓ Downspout situation

Homeowner Interview & Site Assessment (HISA)



 **Homeowner Interview and Site Assessment**
Howard County - Steward Network, Inc.

General Information

Date _____ Assessed by _____

Homeowner Name _____

Address _____

Phone _____ email _____

Homeowner Association: _____

Watershed _____

Subwatershed _____

Observed Weather Conditions _____

Rain in the past 24 hours? Yes No (circle one)

Home has

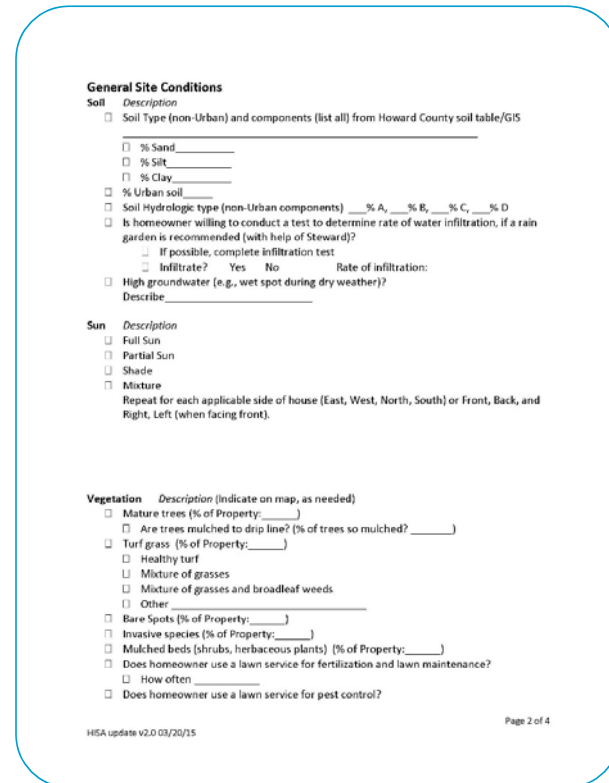
- Well water
- City water
- Septic field (sketch drainage field, if known)
- Sanitary sewer service

Is Owner

- Willing to construct and maintain a retrofit?
- Likely to use contractor?
- Knowledgeable of problem?

Homeowner Identified Issues: describe and/or sketch on map and/or include photo(s)
(Note positions of any utilities and devices, such as electric, phone, heat pumps, etc.)

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General Site Conditions

Soil *Description*

- Soil Type (non-Urban) and components (list all) from Howard County soil table/GIS
 - % Sand _____
 - % Silt _____
 - % Clay _____
 - % Urban soil _____
- Soil Hydrologic type (non-Urban components) ___% A, ___% B, ___% C, ___% D
- Is homeowner willing to conduct a test to determine rate of water infiltration, if a rain garden is recommended (with help of Steward)?
 - If possible, complete infiltration test
 - Infiltrate? Yes No Rate of infiltration: _____
- High groundwater (e.g., wet spot during dry weather)?
Describe _____

Sun *Description*

- Full Sun
- Partial Sun
- Shade
- Mixture

Repeat for each applicable side of house (East, West, North, South) or Front, Back, and Right, Left (when facing front).

Vegetation *Description (Indicate on map, as needed)*

- Mature trees (% of Property: _____)
 - Are trees mulched to drip line? (% of trees so mulched? _____)
- Turf grass (% of Property: _____)
 - Healthy turf
 - Mixture of grasses
 - Mixture of grasses and broadleaf weeds
 - Other _____
- Bare Spots (% of Property: _____)
- Invasive species (% of Property: _____)
- Mulched beds (shrubs, herbaceous plants) (% of Property: _____)
- Does homeowner use a lawn service for fertilization and lawn maintenance?
 - How often _____
- Does homeowner use a lawn service for pest control?

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Figure 5. Potential project sites in the Greenleaf neighborhood.

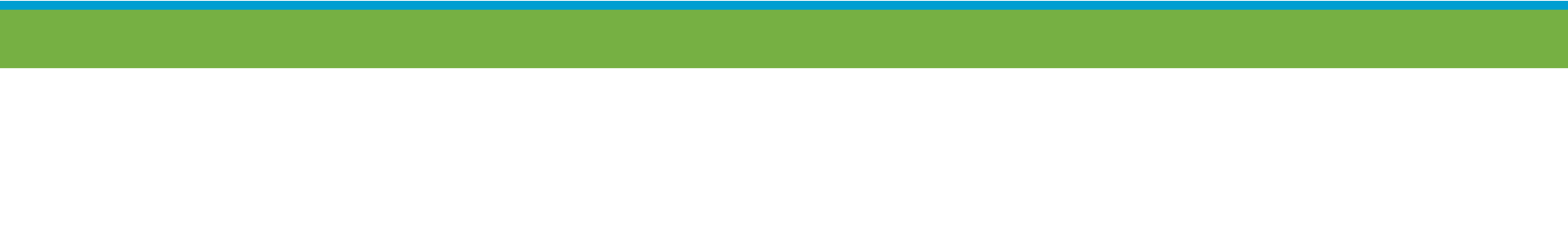
From Information To Action

Pre-contemplation phase - *where residents never seriously thought about needing to change their behavior toward stormwater running off their property*

Contemplation phase - *where we help residents begin to actively think about the need to change their behavior through a variety of tools such as questionnaires, stream assessment findings, etc., with the intent of changing their viewpoint*

Determination/Action phase - *where our outreach efforts having identified the existing barriers that residents have toward implementing actions are offset by educating them to the related benefits associated with the remediation actions to be taken*

Social Marketing Plan

- Background, Purpose, Focus
 - Conduct Situation Analysis
 - Select and Describe Target Audience
 - Set Marketing Objectives and Goals
 - Identify Audience Barriers, Benefits, and the Competition
 - Craft a Desired Positioning Statement
 - Develop a Strategic Marketing Mix
 - Determine an Evaluation Plan
 - Establish a Campaign Budget and Find Funding
 - Outline an Implementation Plan
- 

How We Help The County Meet It's TMDL Goals

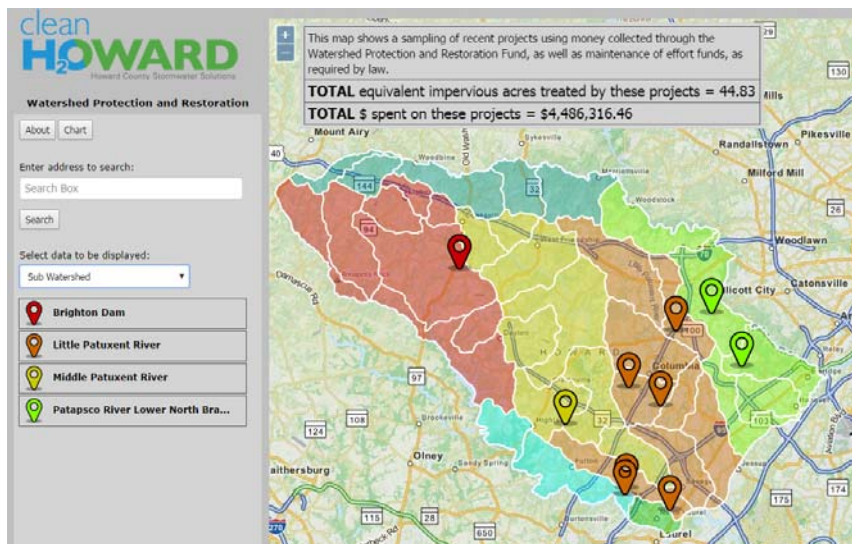
HoCoWSA Program Highlights

Number of Master Watershed Stewards since program inception	23
Number of current steward candidates	8
Number of native trees/plants installed	1,238
Number of rain barrels and cisterns installed	10
Square footage of projects	16,713
Number of rain gardens/conservation landscapes installed	13
Number of volunteer hours	4,549
Number of people reached	2,533
Storm drains stenciled	59
Sq. Ft. Invasive plants removed	1002
Homeowner's Association that WSA is currently working with	14
Number of stream assessment conducted	22
Number of resident site assessments conducted	38
Sq. Ft. of Streamside Forest Buffers Planted	21,780
Number of village watershed committees founded	2
Number of presentations/workshops	31
Number of websites created	1

Assisting Local Communities



Education & Awareness



Education & Awareness



Educating homeowners of stormwater concerns – including illicit discharges



Education & Awareness



Informational Tables at various events



Storm drain stenciling

Education & Awareness



Questions?

Terry Matthews

Program Coordinator - Howard County Watershed Stewards Academy

trmatt@umd.edu

410-313-2711

Radhika Wijetunge

Brown & Caldwell

rwijetunge@brwnncald.com

301-479-1277

WSA Whitepaper (Fisher et al): "A Voice for the River, A Voice for the Stream." Organizational Perspectives on Environmental Stewardship and the Maryland Watershed Stewards Academies

http://www.cse.umd.edu/uploads/1/7/9/4/17940149/wsa_white_paper3.pdf

