

# Patapsco River Lower North Branch Watershed Assessment

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COMMUNITY MEETING NO. 1

June 23, 2016



# Meeting Outline

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- Welcome and Introductions
- Reasons for Study
- Watersheds 101
- Overview of Current Watershed Conditions
- Restoration Toolbox
- Q&A – Information Stations



# Why is the County doing a Watershed Assessment?

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- Municipal Separate Storm Sewer System (MS4) National Pollutant Discharge Elimination System (NPDES) permit
  - Permit requires treatment of 20% of currently untreated impervious
  - Perform a comprehensive watershed assessment for the entire County within five year permit term
    - Little and Middle Patuxent Rivers in FY15 (Permit Year 1)
    - Patapsco and Mainstem Patuxent Rivers in FY16 (Permit Year 2)
  - Develop a Countywide restoration plan in Year 1 (CIS)
- Total Maximum Daily Load (TMDL) “pollutant diet” for nutrients
- Looking for cost-effective opportunities for environmental restoration

# Chesapeake Bay TMDL

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- Chesapeake Bay TMDL Sectors:
  - Agriculture
  - Forest
  - Septic
  - Wastewater
  - Urban Stormwater
- NPDES Permit Year 1 - Restoration Plans for All Existing TMDL Waste Load Allocations
- All Sectors – Reduce Phosphorus (P) by ~30% and Nitrogen (N) by ~40% (approx half of total reduction is urban stormwater)
- Meet 60% by 2017 and 100% by 2025

# General Strategies

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To restore, enhance and protect the County's natural resources.

- Reduce negative impact of impervious surfaces
- Reduce levels of pollutants in waterways
- Reduce streambank erosion
- Increase forest area and connectivity of riparian habitats
- Increase public awareness and positive behaviors



# Watersheds

## 101



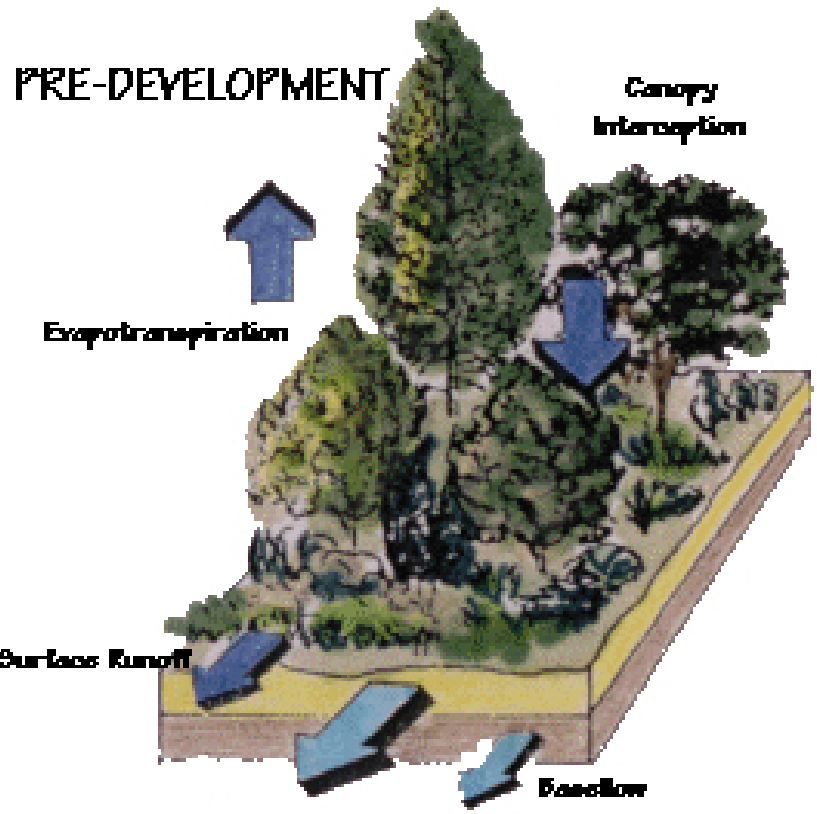
What is a Watershed?  
&  
What is Stormwater Management?



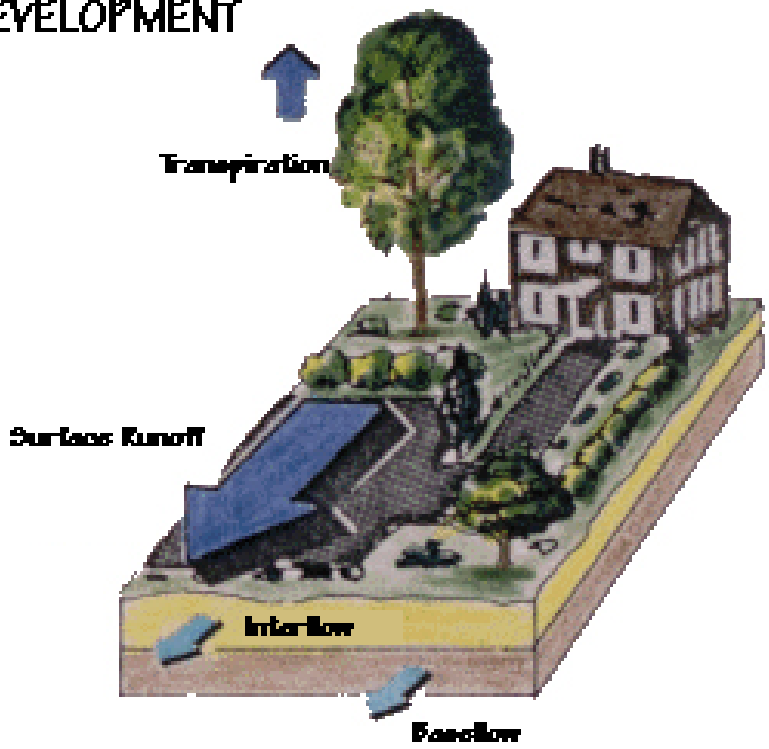


# WATER BALANCE

## PRE-DEVELOPMENT



## POST-DEVELOPMENT



# Where does storm water go?

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- A. To a wastewater treatment plant so pollutants and trash can be removed before the water goes to a nearby stream.
- B. To a nearby stream without any treatment.
- C. To a stormwater management pond for pollutant removal and then to a nearby stream.
- D. B or C



# The Problem



Pollutants build up on impervious surfaces and wash off into the stream system when it rains

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# Harmful Pollutants in Runoff



Bacteria

Nutrients

Pesticides

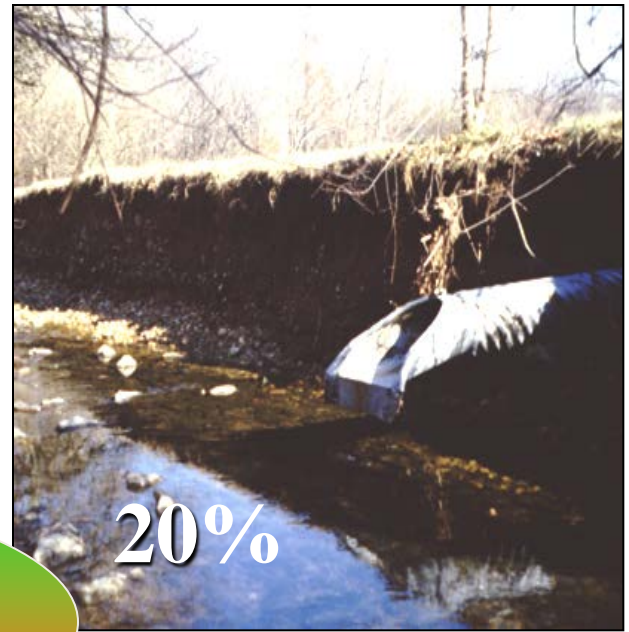
Oil & Grease

Muddy Water

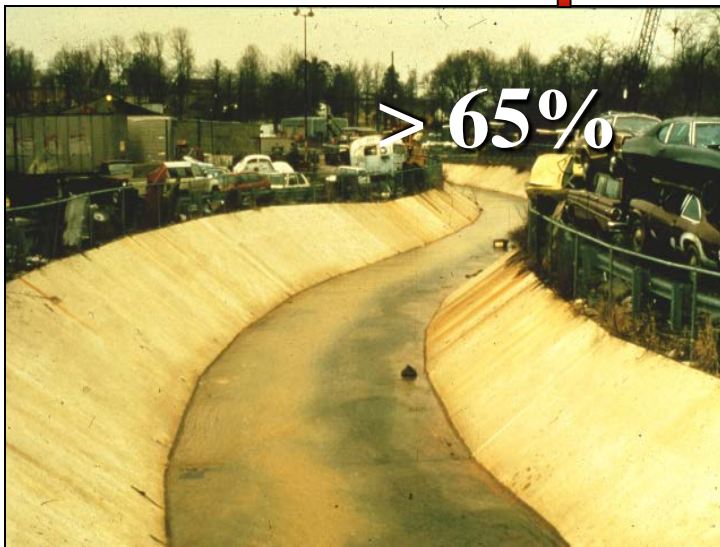
Heavy Metals

(e.g. Zinc, Copper, Lead)

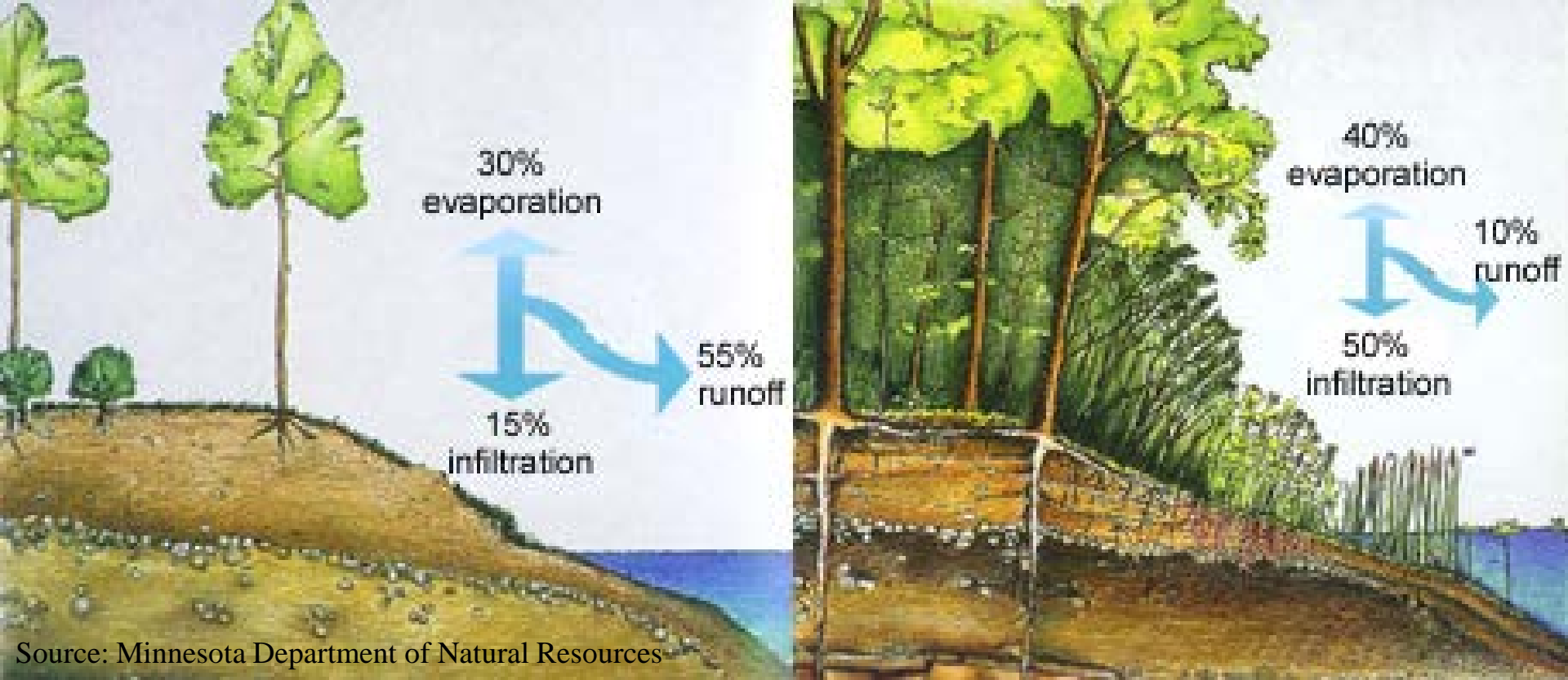




**Impervious Cover**



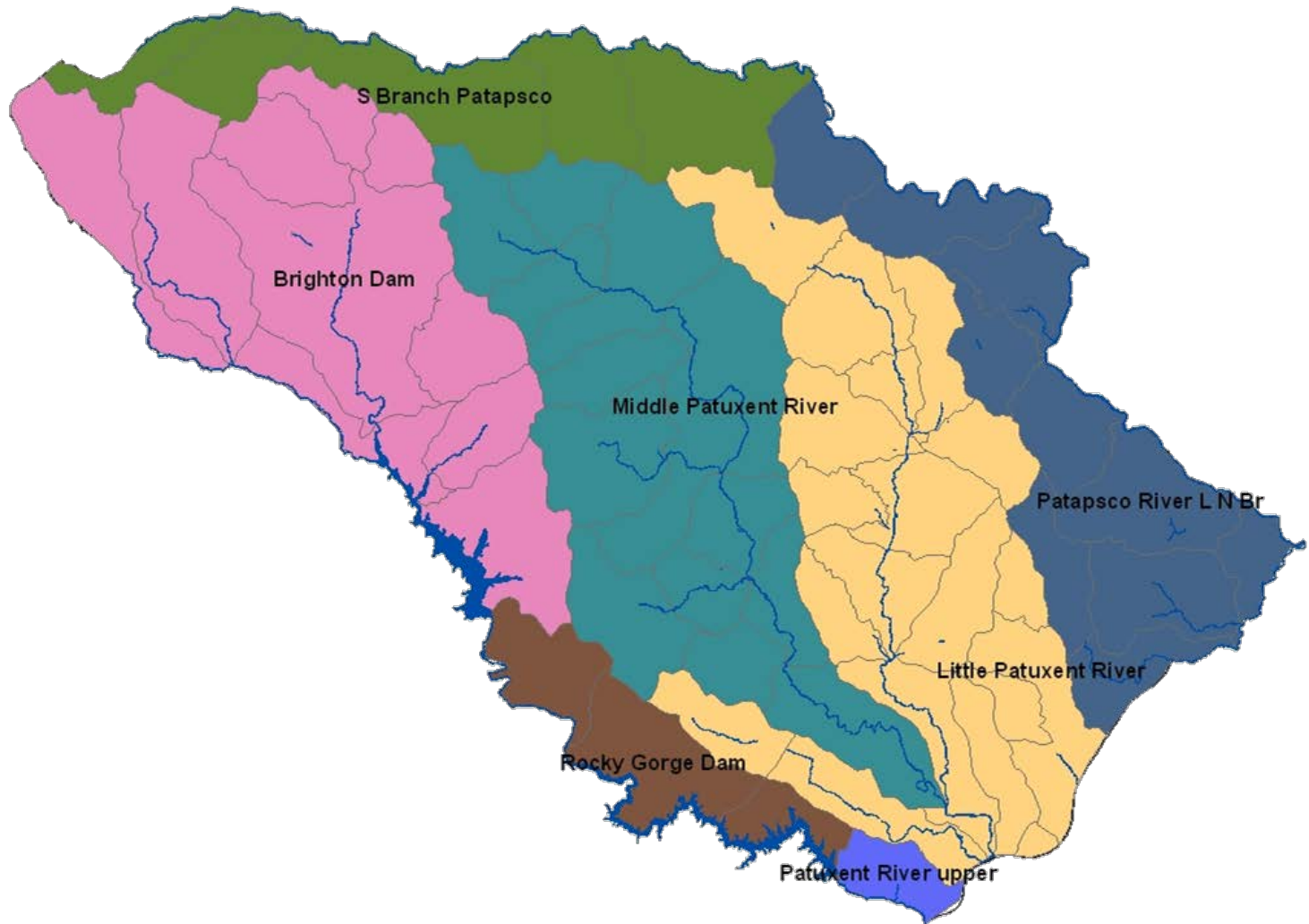
**County = 13.6%    Columbia ~ 15%-20%**



Water quickly runs off a shoreline cleared of natural vegetation, washing nutrients and pesticides into the water. A natural shoreline holds rainfall, which soaks into the soil; less water, soil and chemicals run into the lake or river. Shoreline and aquatic plants anchor shoreline areas, helping to protect them from erosion due to runoff and waves (Source:MN DNR)

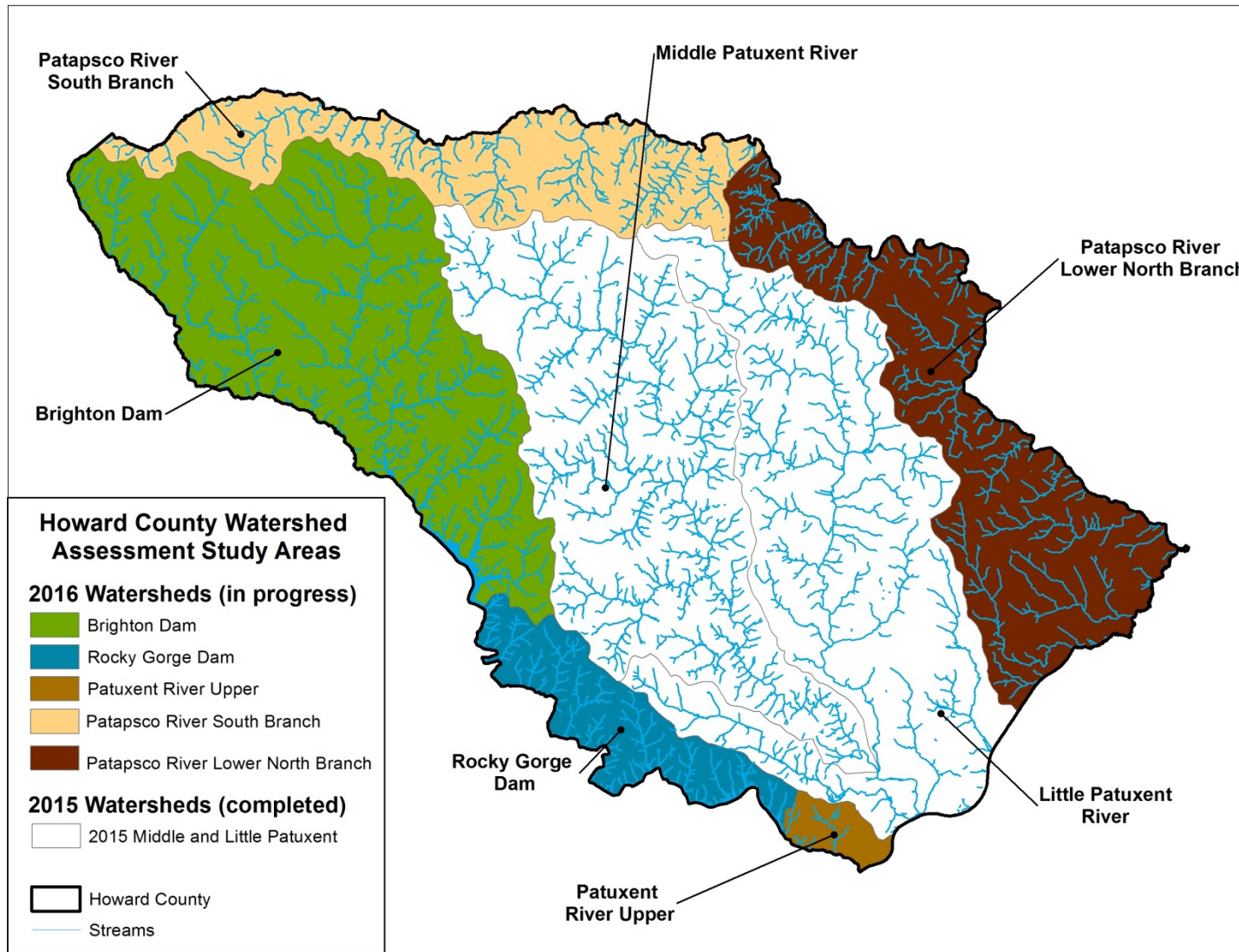
# County Watersheds

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# Breakdown of Study Areas

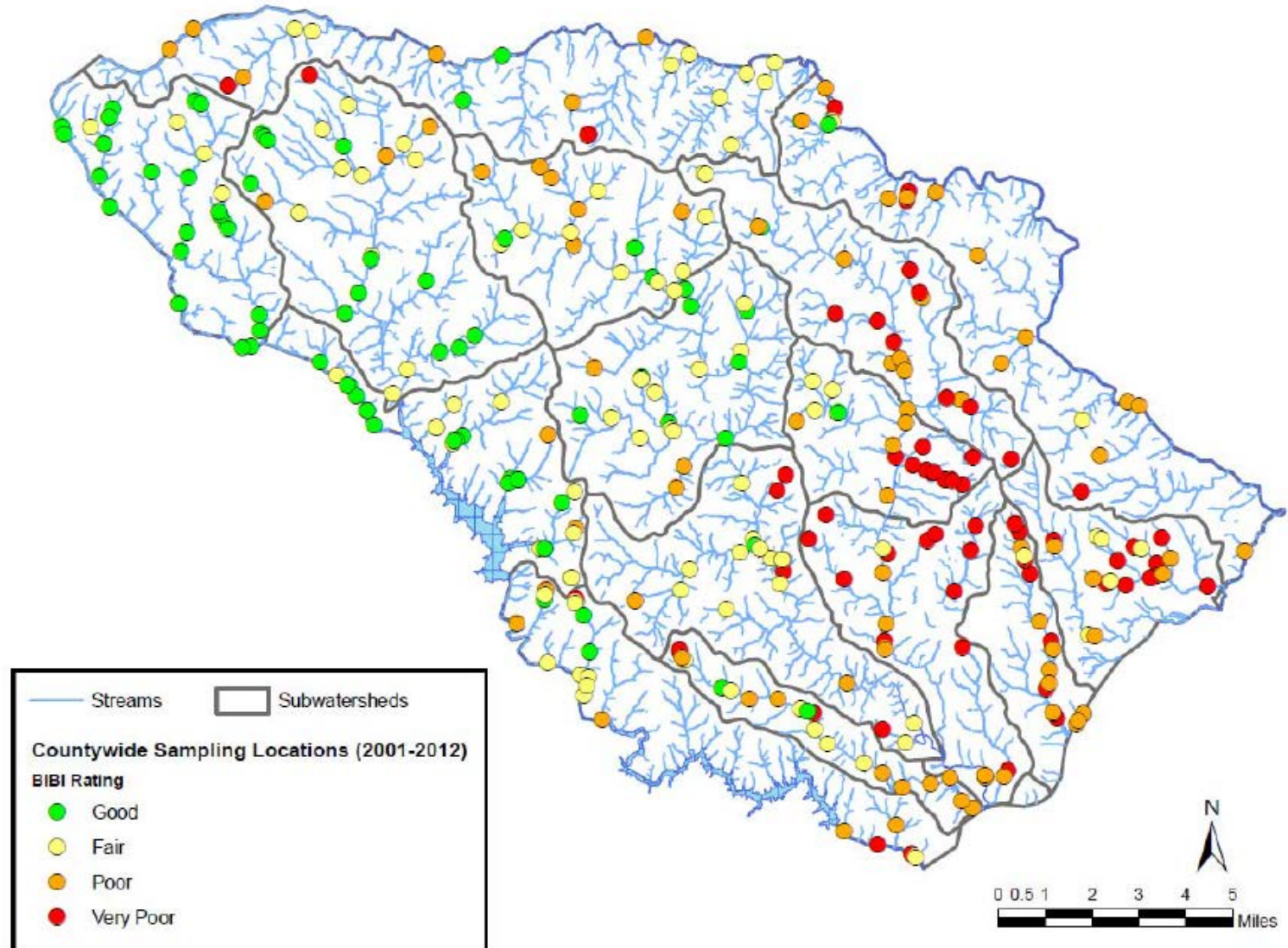


# Watershed Study Overview

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- Phase I – completed mid-July 2016
  - Desktop Analysis
  - Handheld Tablet Setup and Programming
  - Consultant Field Calibration and Training
  - Field Assessment (Approx. 3 months)
  - Review and Compile Field Data
  - **Community Meetings - #1**
  - Prepare Site Ranking and Prioritization

# Monitoring Results – Biological Health



# Project Types Being Investigated

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- Retrofit of Existing BMPs
- New BMPs
- Outfall Stabilization
- Stream Restoration
- Reforestation/Riparian Buffers
  
- Source reduction?

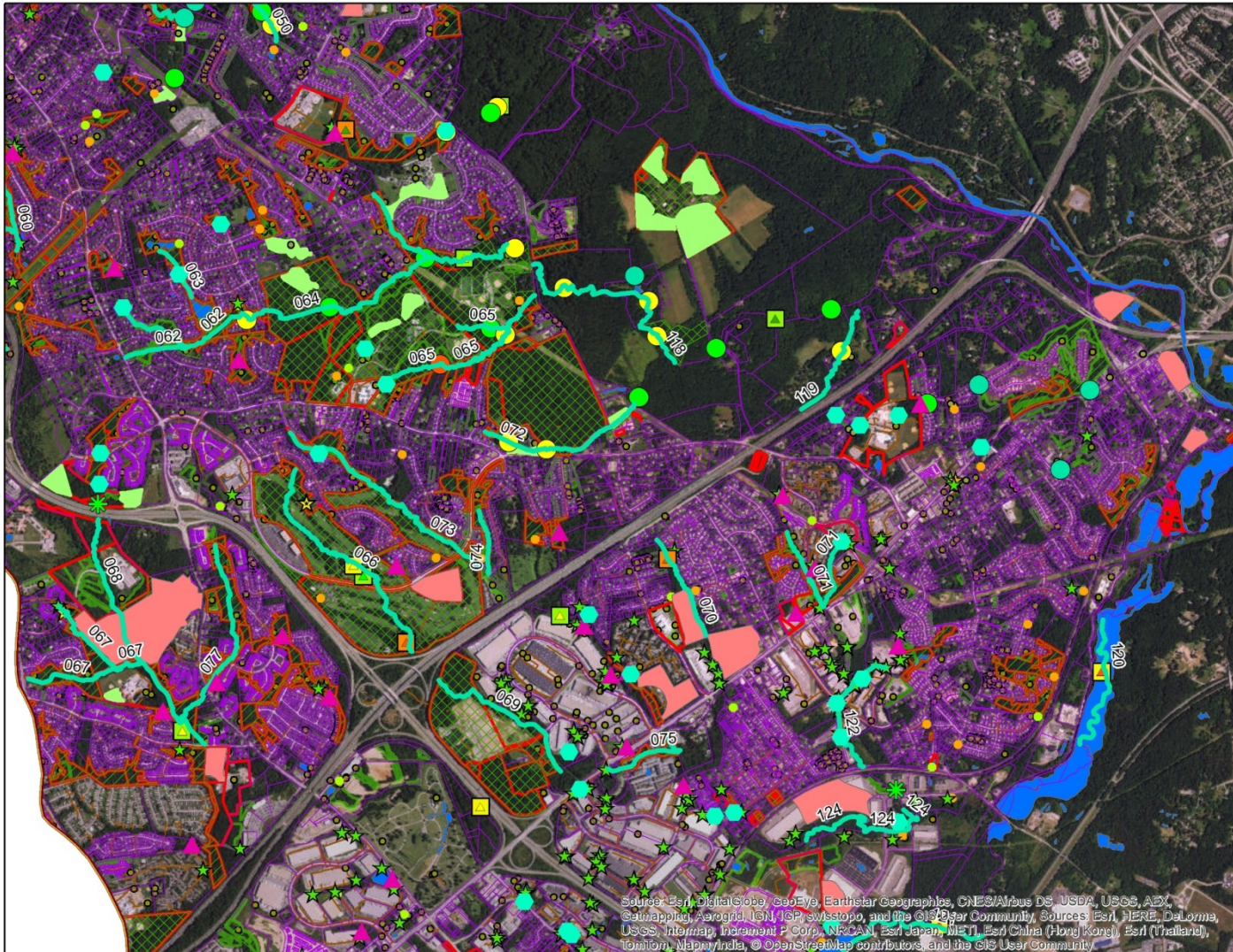
# Desktop Analysis

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- Data Review and Processing
  - Previous Studies
  - Existing Monitoring Results
  - Drainage Complaint Database
  - GIS Queries
- Create GIS Maps and Overlays
- GIS Review (Office)
  - Multiple Day Review of All Sites From GIS Analysis
  - Generated Final Map and List of Sites For Field Review

# Desktop Analysis

Sample composite GIS map used for final office review

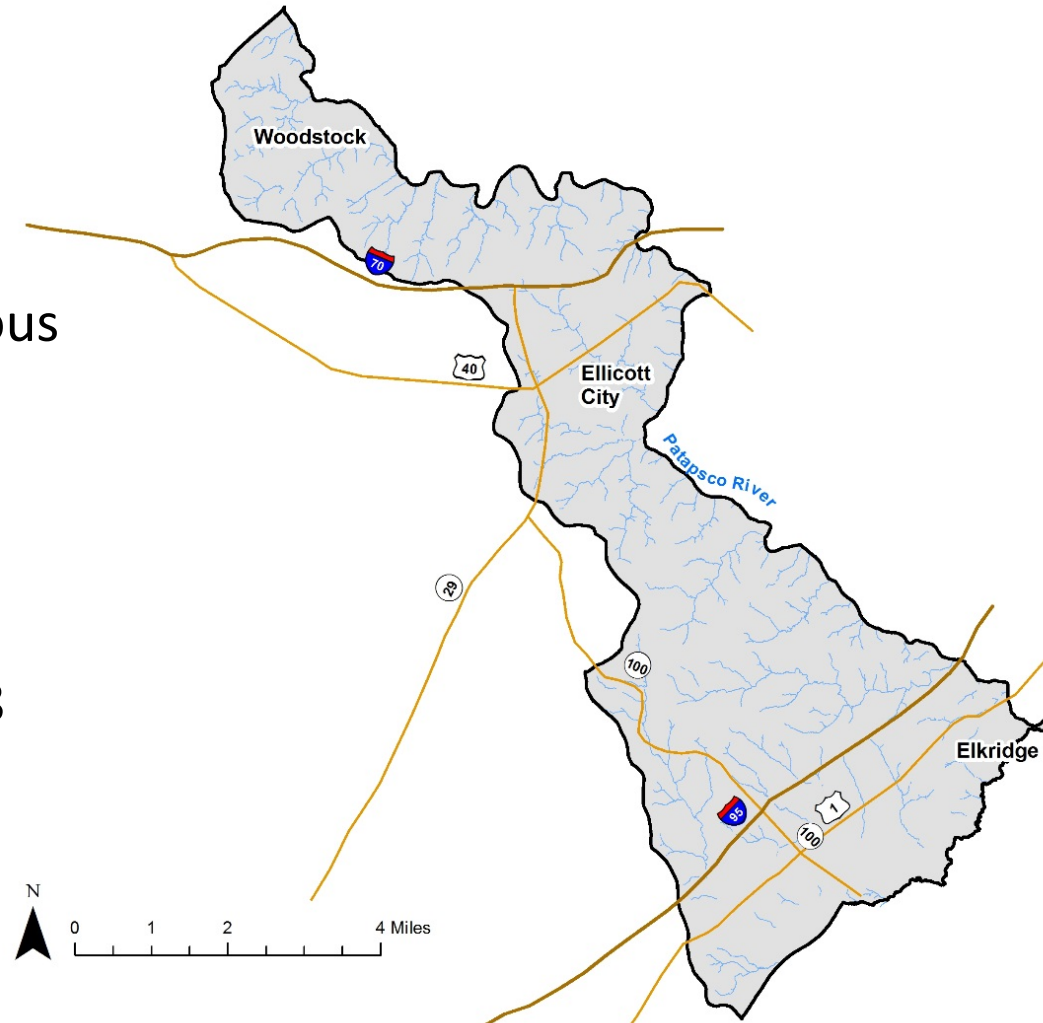


# Watershed Characteristics

# Patapsco River Lower North Branch Watershed

## Patapsco Lower North Branch

- 37.9 square miles
- 24,232 acres
- 4,425 total impervious acres
- 3,855 County impervious area
- 8,340 wooded acres
- 1,772 stormwater BMPs treating 1,688 acres of impervious surface



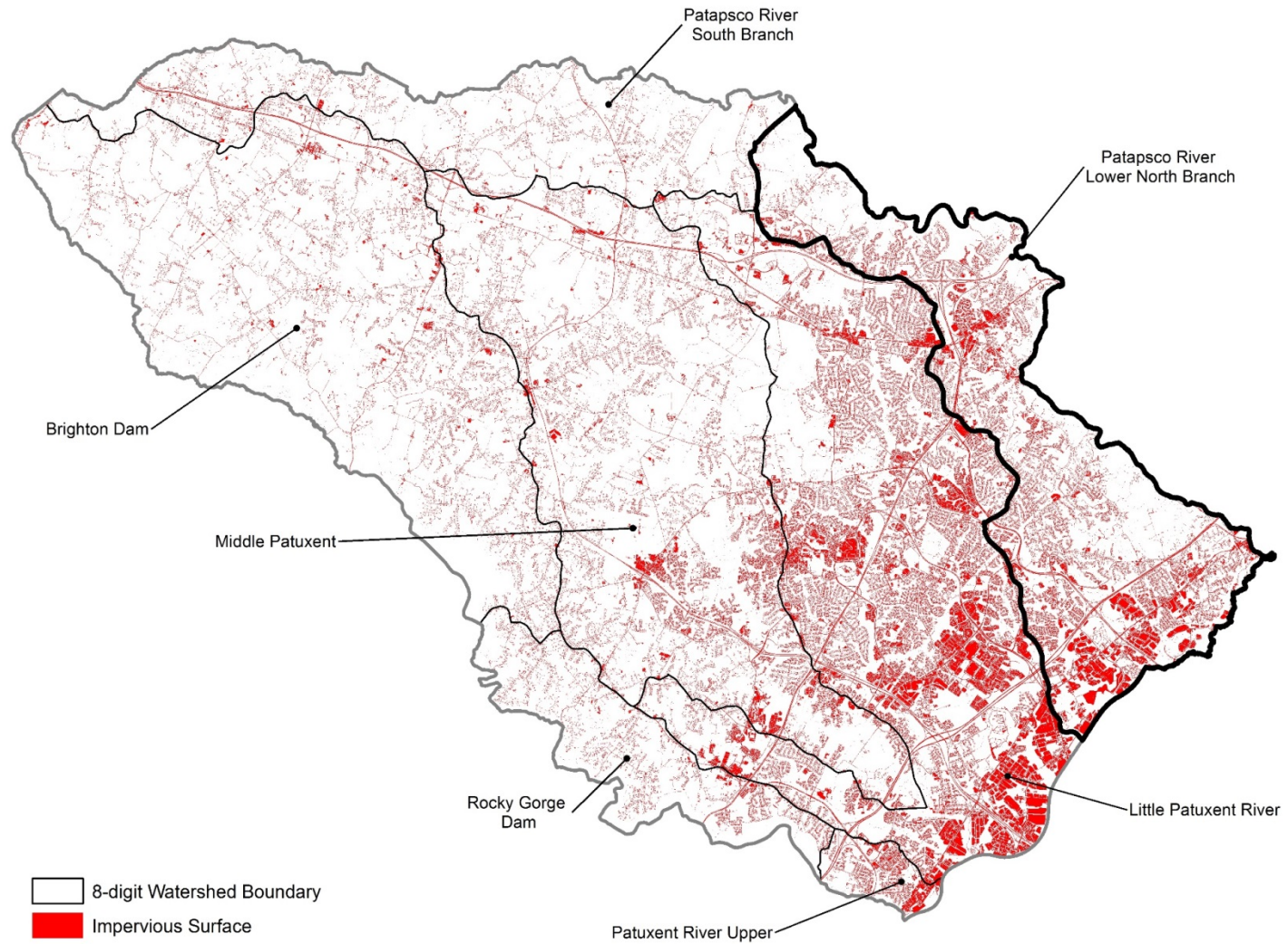


# Imperviousness

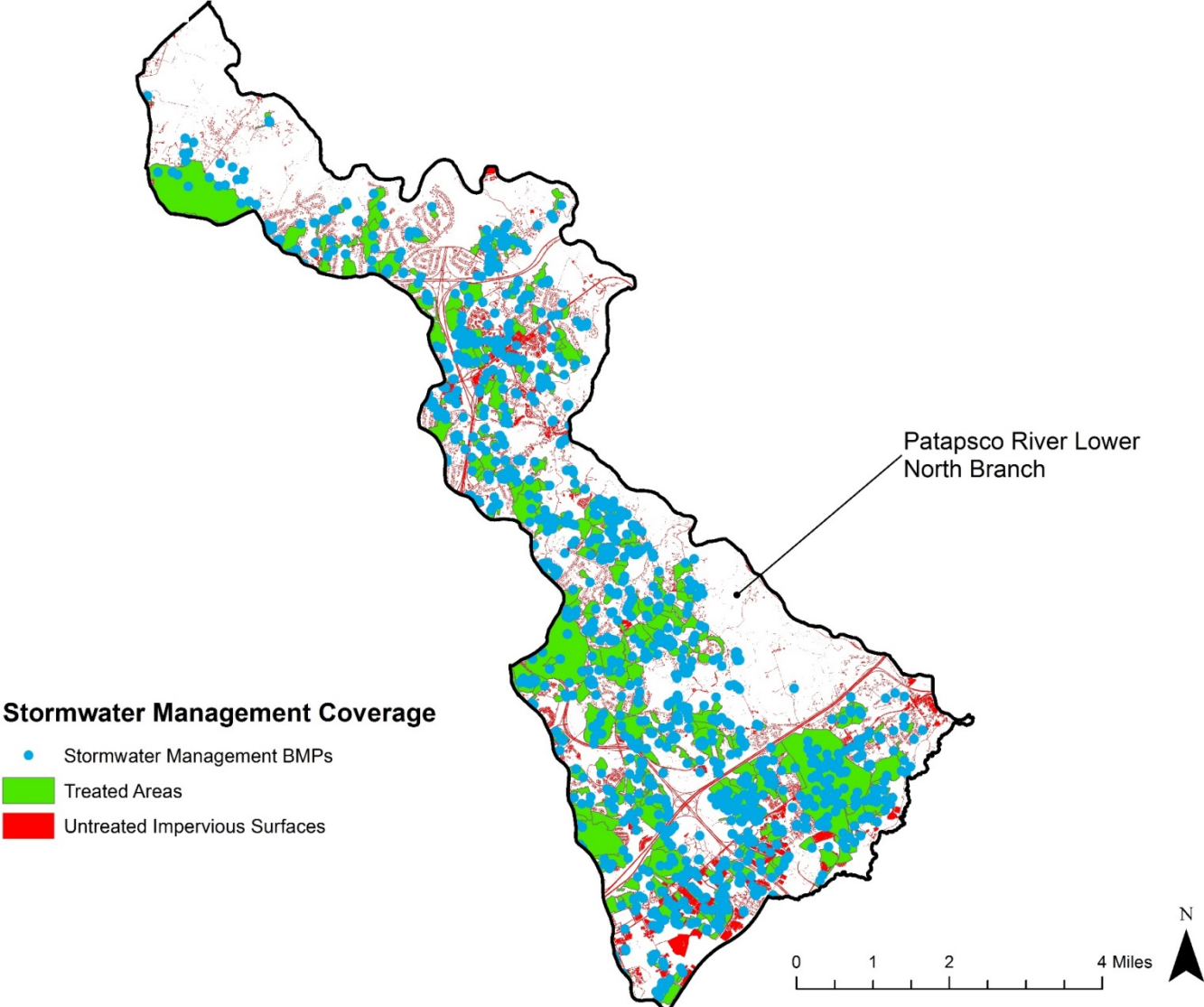
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	Total Area (sq miles)	Impervious Area (sq miles)	Impervious Percent
County	253	34.3	13.6%
Patapsco River LNB	38	6.9	18.2%
Percent of County	15%	20%	n/a

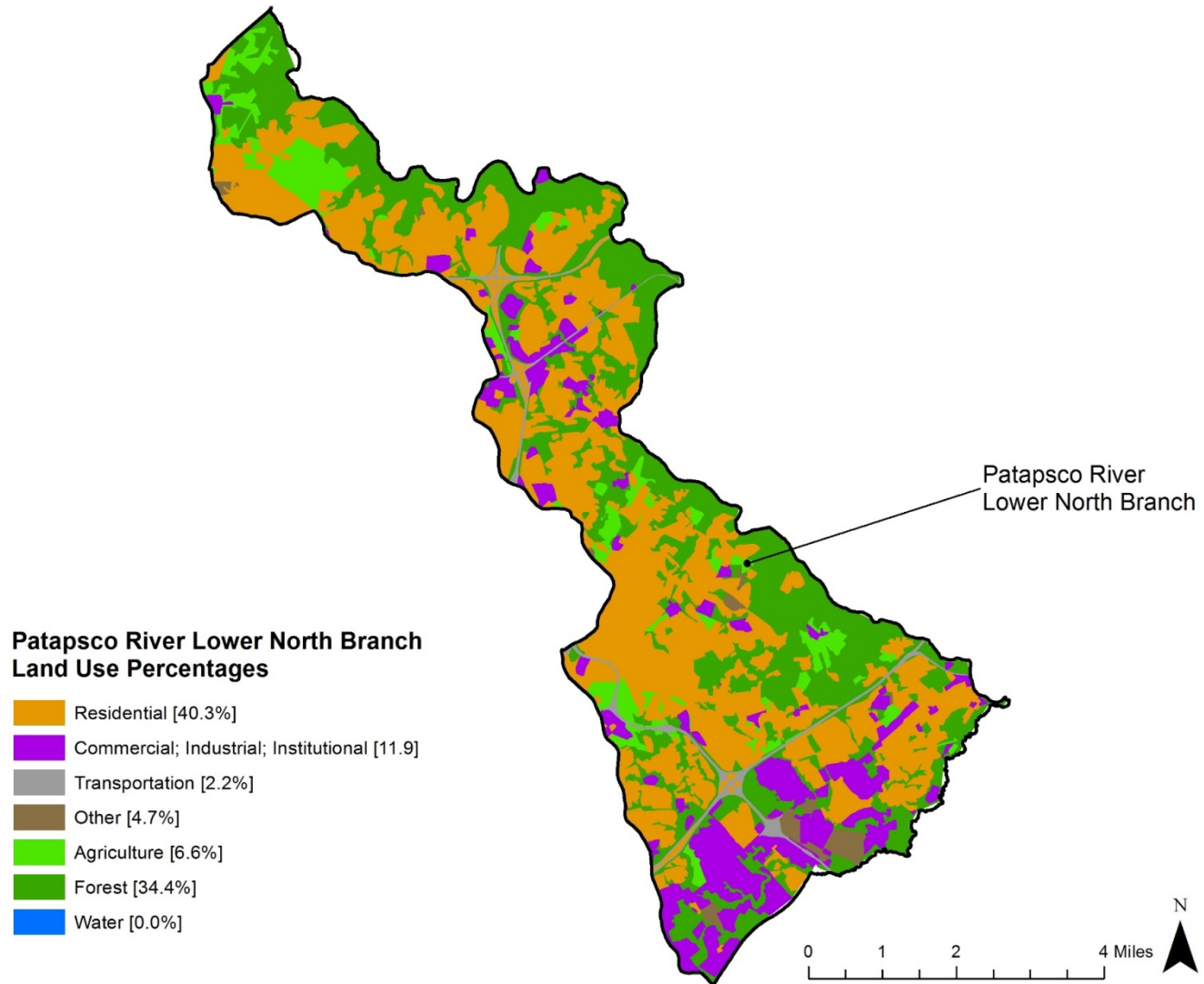
# Imperviousness



# Stormwater BMPs



# Land Use



# Field Assessments and Results

# Field Assessment

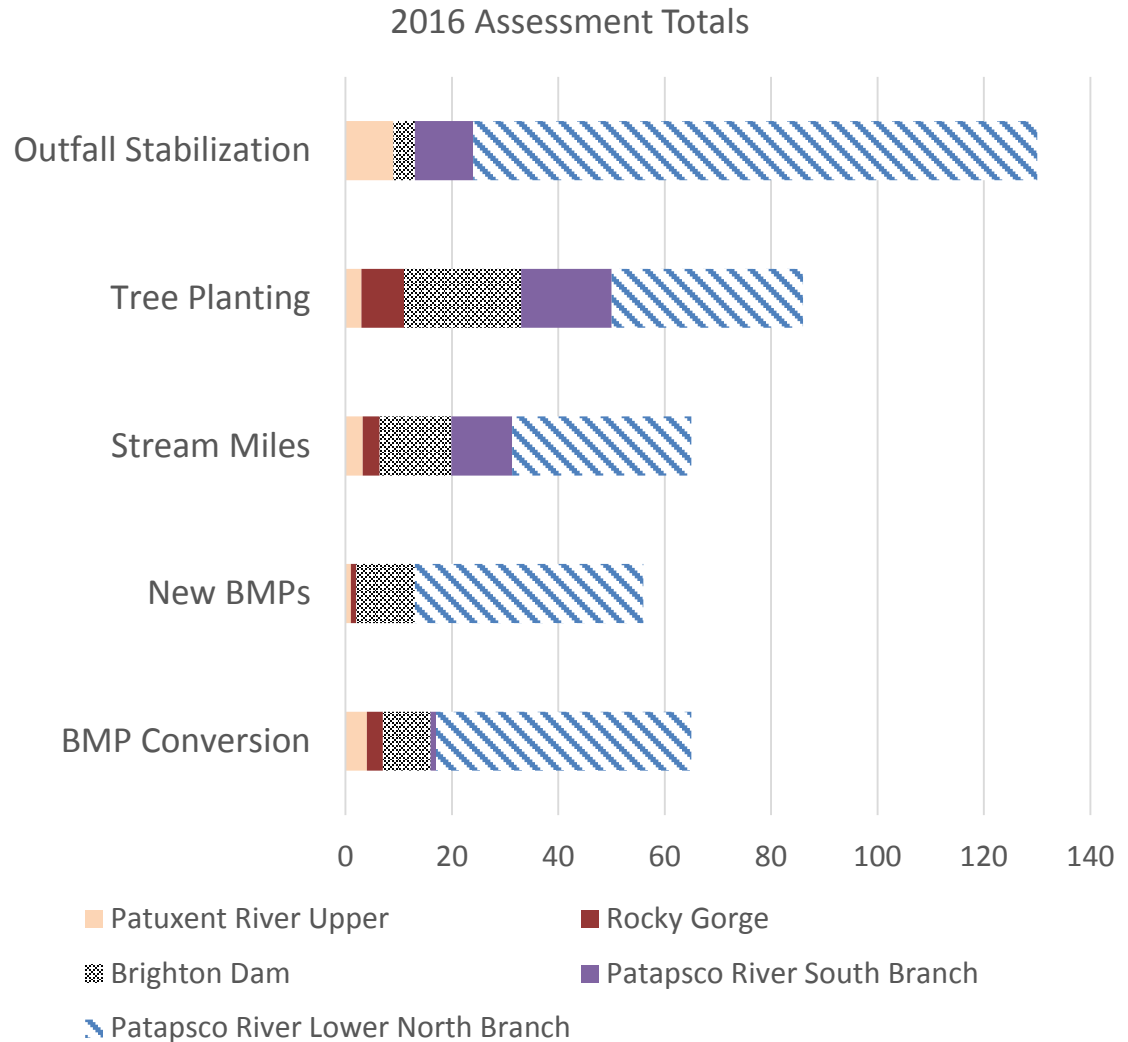
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# Assessment Results - Total

## Sites Assessed:

- 130 Outfall stabilizations
- 86 Tree planting sites
- 65.0 Stream miles
- 56 New BMP sites
- 65 BMP conversions

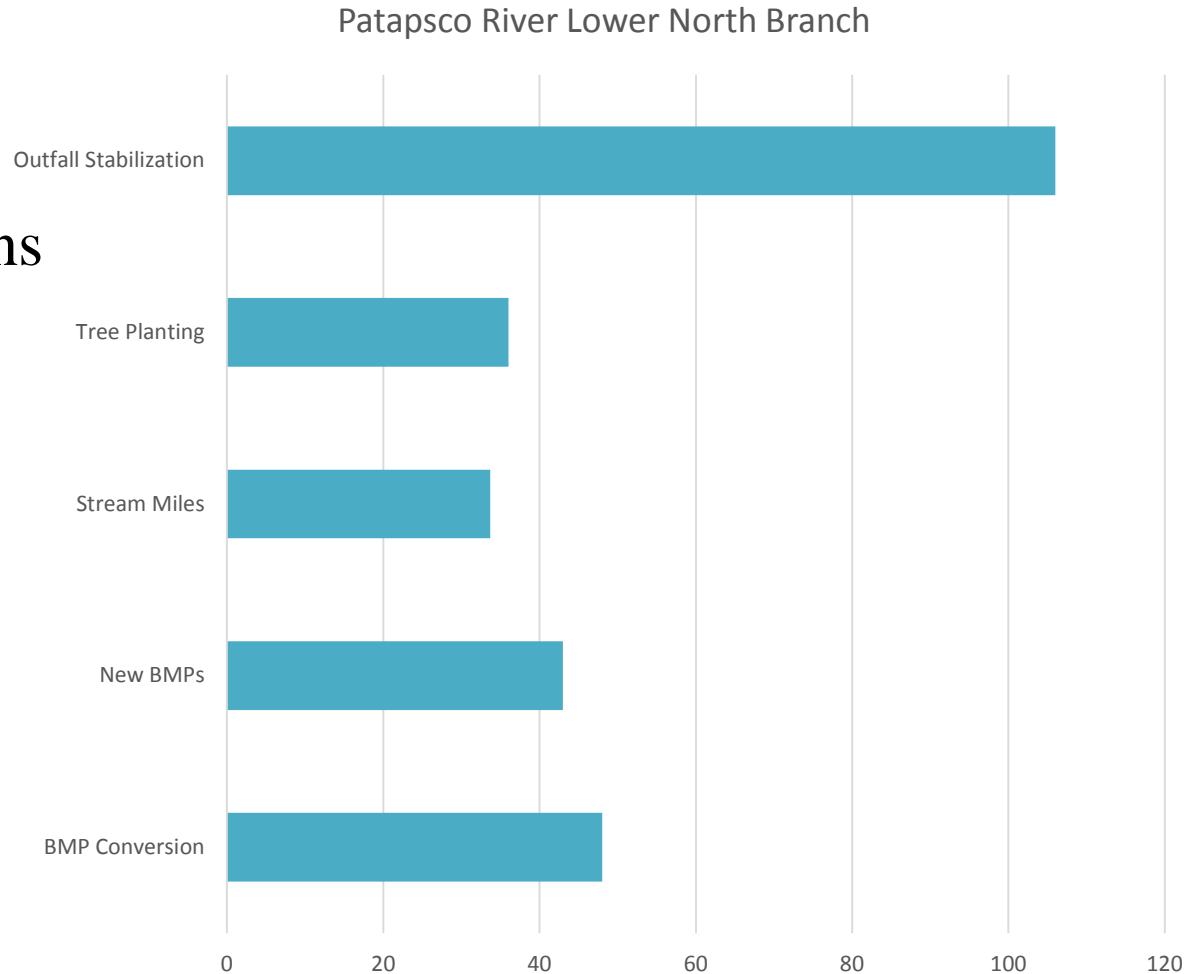


# Assessment Sites –Patapsco River LNB

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## Sites Assessed:

- 106 Outfall stabilizations
- 36 Tree planting sites
- 33.7 miles of stream
- 43 New BMP sites
- 48 BMP conversions





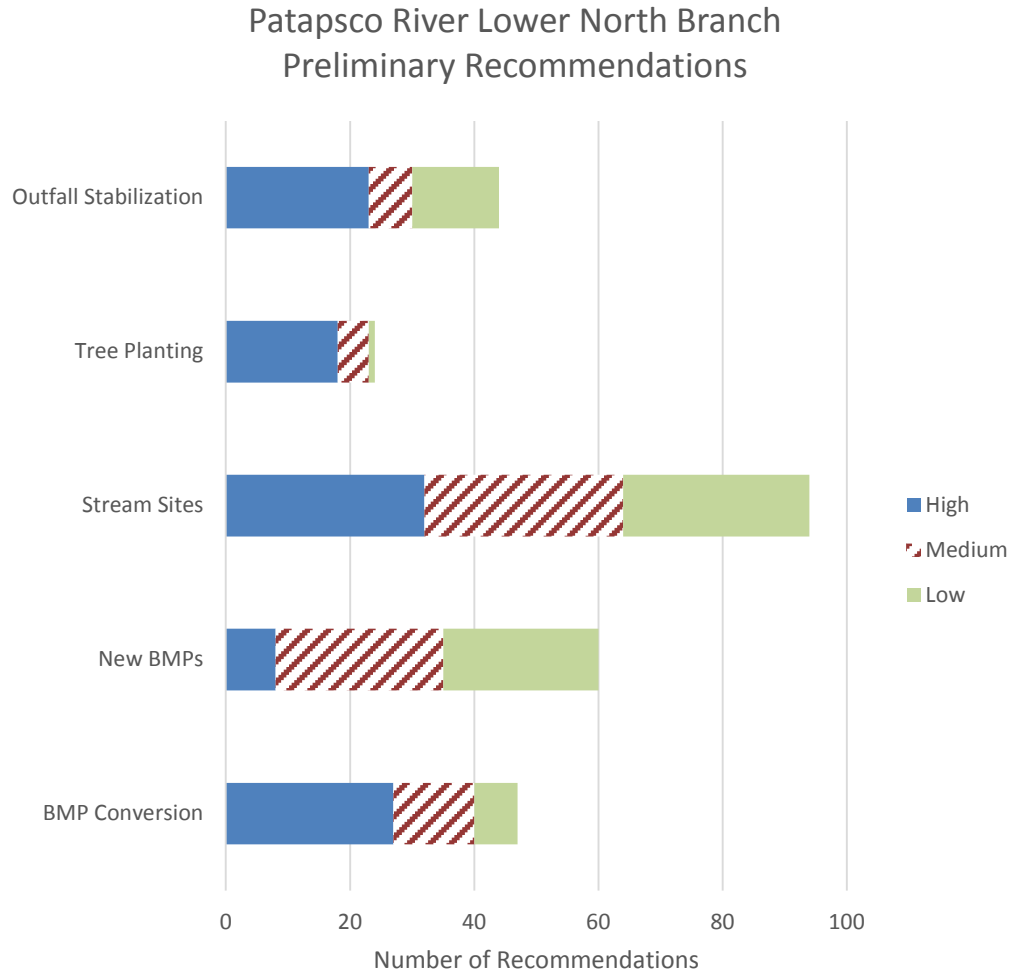
# Assessment Recommendations – Patapsco River LNB

## High Priority Sites:

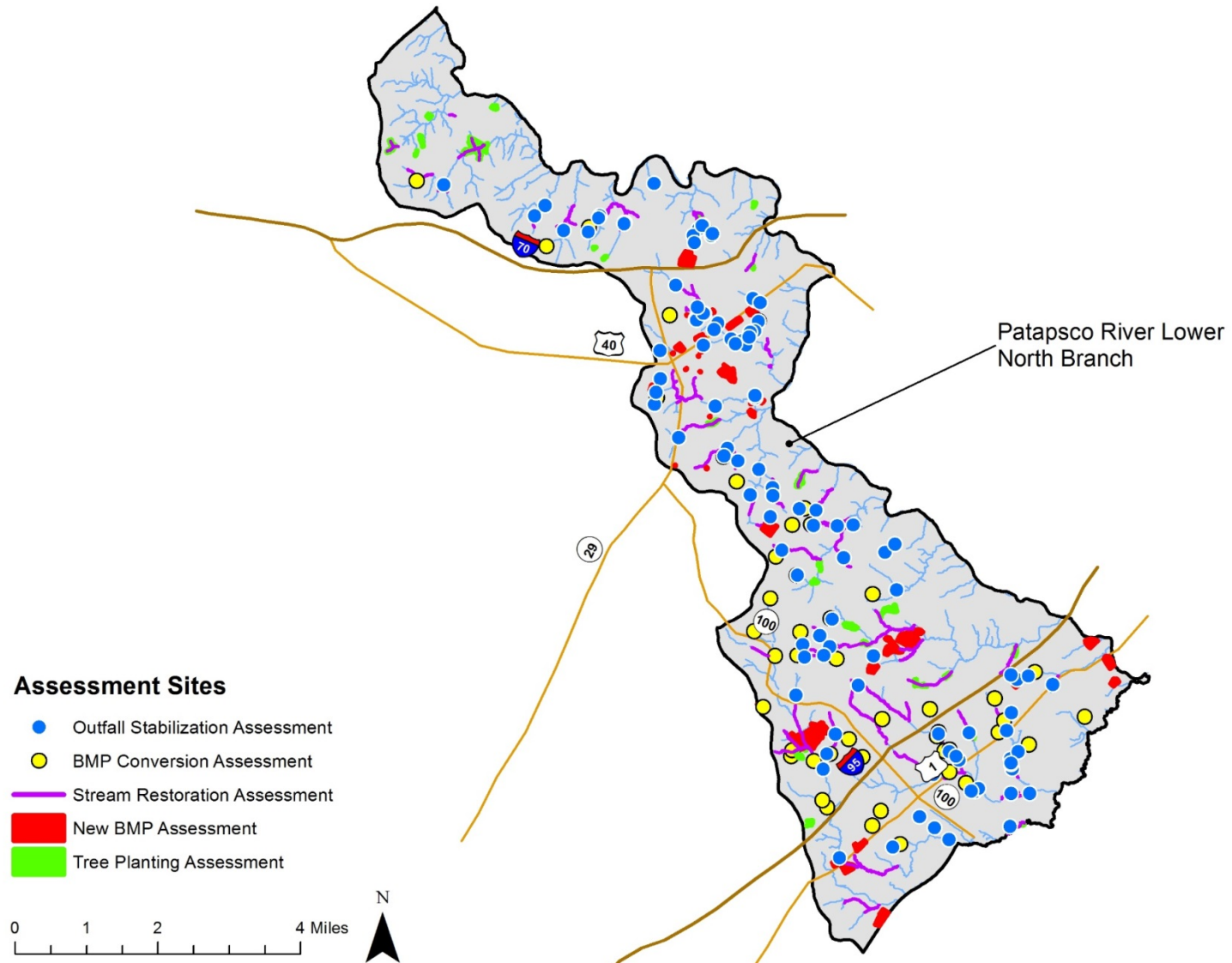
- 23 Outfall stabilizations
- 18 Tree planting sites
- 32 Stream sites
- 8 New BMP sites
- 27 BMP conversions

## Medium Priority Sites:

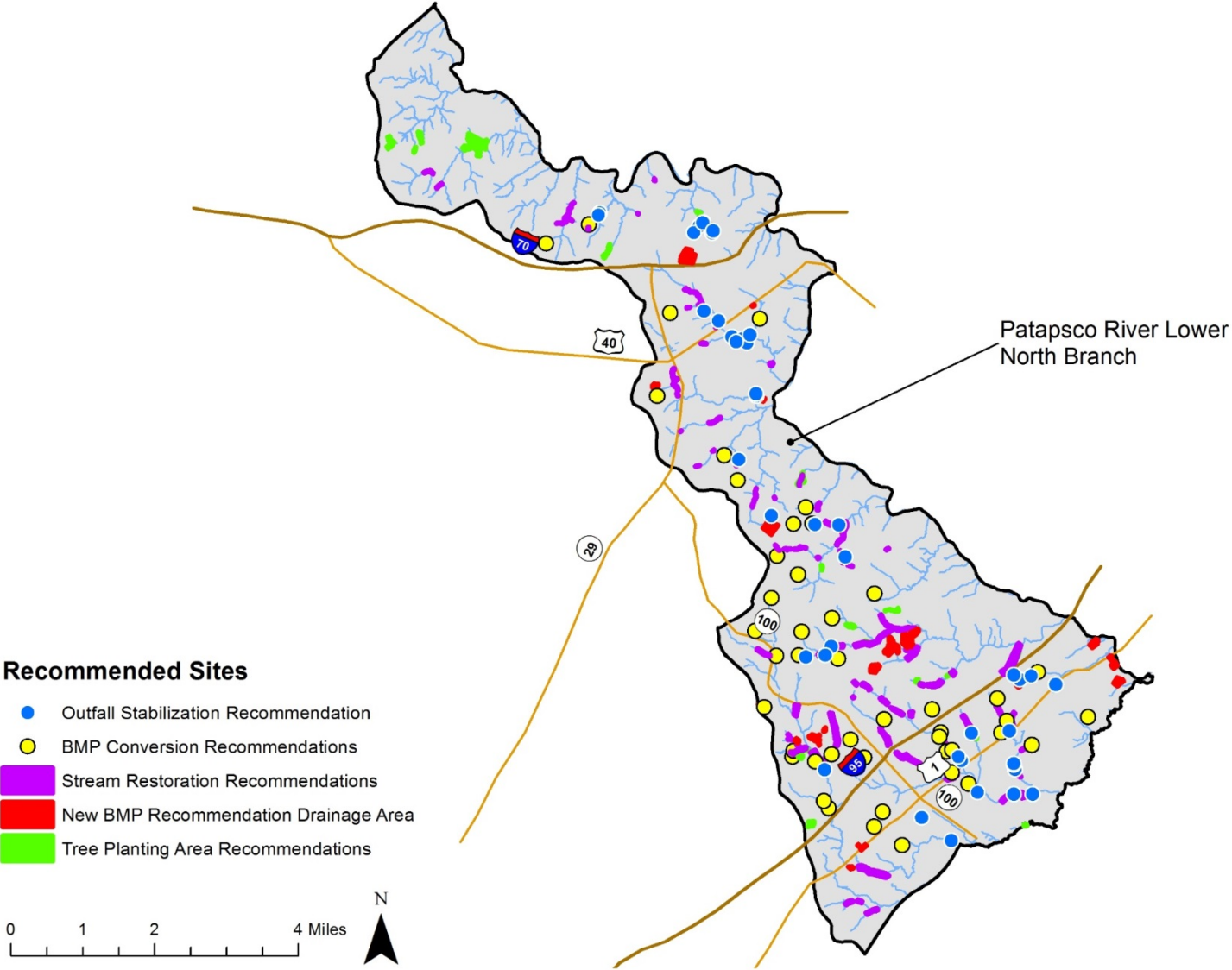
- 7 Outfall stabilizations
- 5 Tree planting sites
- 32 Stream sites
- 27 New BMP sites
- 13 BMP conversions



# Assessment Sites –Patapsco River LNB



# Recommended Sites – Patapsco River LNB



# Watershed Study Overview

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- Phase II – scheduled completion end of 2016
  - Perform Concept Level Designs (Including Cost Estimates)
  - Rank sites (\$/acre of impervious treated)
  - Input to restoration plan update (CIS)
  - Generate Draft Watershed Report
  - Community Meetings - #2 (Fall 2016)
  - Review and Comment Period
  - Final Report to MD Department of the Environment

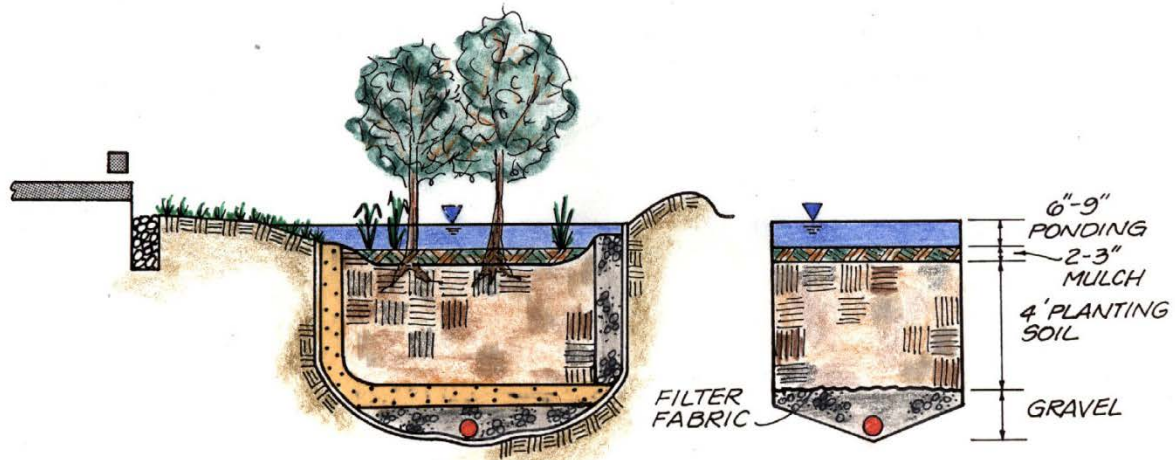
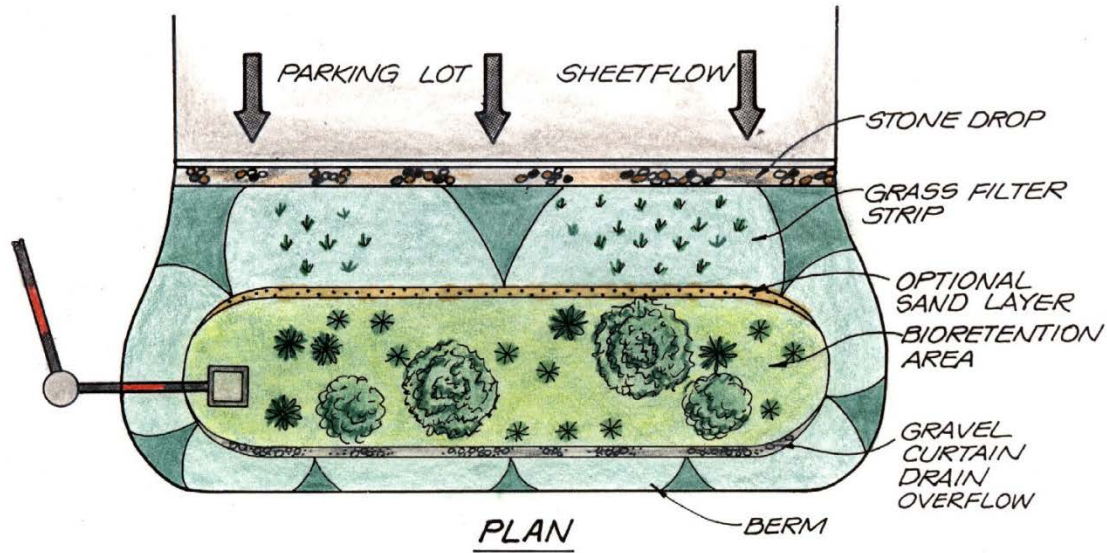
If we build it, they will come . . .

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# Restoration Toolbox

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PROFILE

TYPICAL SECTION

**BIORETENTION FILTER**

# Bioretention Facility

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# Bioretention



# Pond Retrofit Project

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# Pond Retrofit Project

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# Permeable Pavement

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# Outfall Stabilization



# Stream Restoration

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# Riparian Buffer Enhancement

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# Riparian Buffer Enhancement

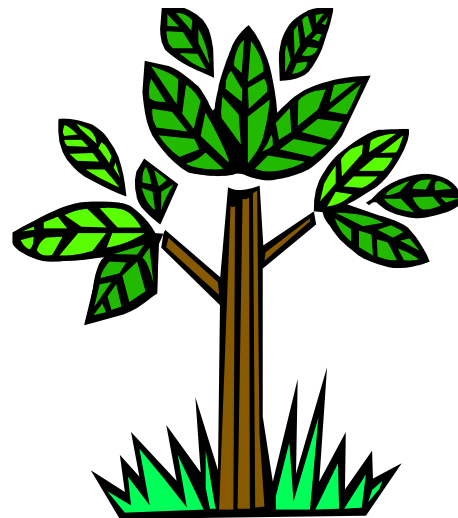
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**What can homeowners do to improve the water quality in the their watershed?**



# Everyday Things

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Reduce the amount of fertilizer you use

Remember that anything that runs off your driveway or lawn ends up in the creek

Oil leaks

Pesticides

Pick up after your pet

No dumping

Reduce runoff from your yard

Disconnect your downspouts

Reduce turf area

Plant a tree

Reduce, Reuse and Recycle!!



# Frequent Fertilizers

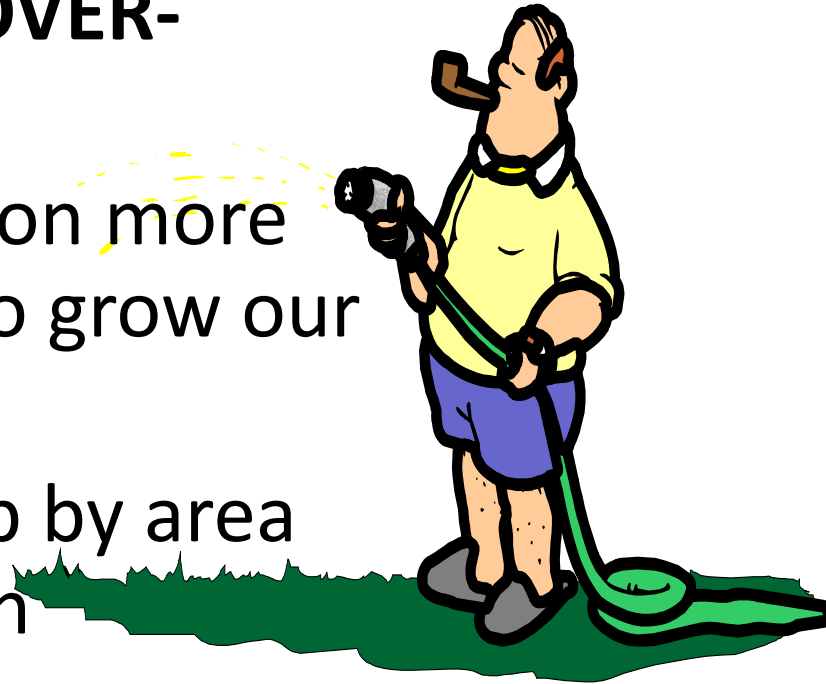
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Nutrient runoff from lawns can cause eutrophication in streams, lakes & estuaries

**52% of people who fertilize OVER-fertilize**

People who over-fertilize put on more nutrients than farmers do to grow our food

Turf grass is single largest crop by area in the Chesapeake Bay Basin



# Chronic Car Washers

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55-70% of households wash their own cars

60% are “chronic car washers” who wash their car at least once a month

**70-90% report that their wash water drains directly to the street and the storm drain**



# Poor Pooch Poop Scoopers

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- 41% of people own dogs
- Of dog walkers, **41% admit they rarely or never clean up**
- Of these, 44% would not clean up even with a fine, complaints, collection or disposal methods
- However, 63% agreed that pet wastes contribute to water quality problems



**Attention  
Dog Guardians**

Pick up after your  
dogs. Thank you.

**Attention Dogs**

Grrrrr, bark, woof.  
Good dog.

District of North Vancouver.  
Bylaw 5981-11(i)



# Volume Reduction

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There are both simple and complex ways to reduce runoff from our yards

- downspout disconnection
- rain barrels
- rain gardens
- lawn conversion

# Bad Approach







Good Approach

# Rain Barrel



Overfertilization?  
Too much turf?



Disconnected impervious



# Rain Garden



Lack of  
riparian buffer.

# What can be recycled in the blue carts?

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## ❖ Paper & Cardboard



## ❖ Glass Bottles and Jars



## ❖ Metal



## ❖ Plastic



# Want to learn more about stormwater?

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Office of Community Sustainability

[www.cleanwaterhoward.com](http://www.cleanwaterhoward.com)



# Summary

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- County has completed the initial assessment phase of the Patuxent and Patapsco River watershed study. There is still more work to be done and we will report back again Fall 2016.
- The County continues to strive for water quality improvements through large and small efforts.
- **We can ALL make a difference!**