# Watershed Assessment

An introduction to the watershed planning process and current work – Fall 2024



DEPARTMENT OF
**ENVIRONMENTAL
PROTECTION**
MONTGOMERY COUNTY · MARYLAND

# DEP Mission:

To enhance the quality of life in our community by protecting and improving Montgomery County's air, water, and land in a sustainable, innovative, inclusive, and industry-leading way while fostering smart growth, a thriving more sustainable economy and healthy communities.
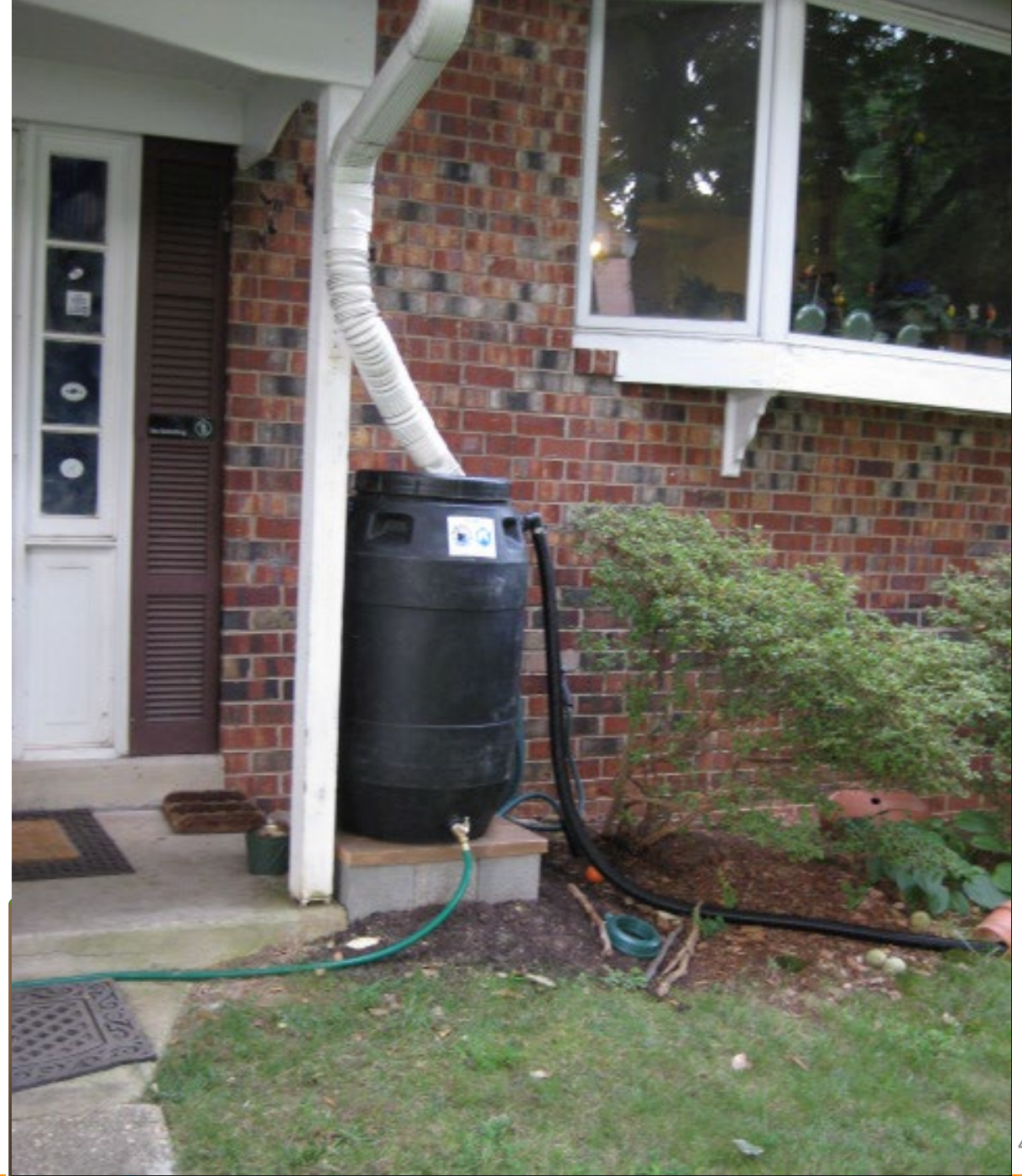
# Watershed Assessment Vision:

Protect and improve water quality and watershed health in Montgomery County. Set measurable goals, collect data to support decision making, and assess progress toward those goals.
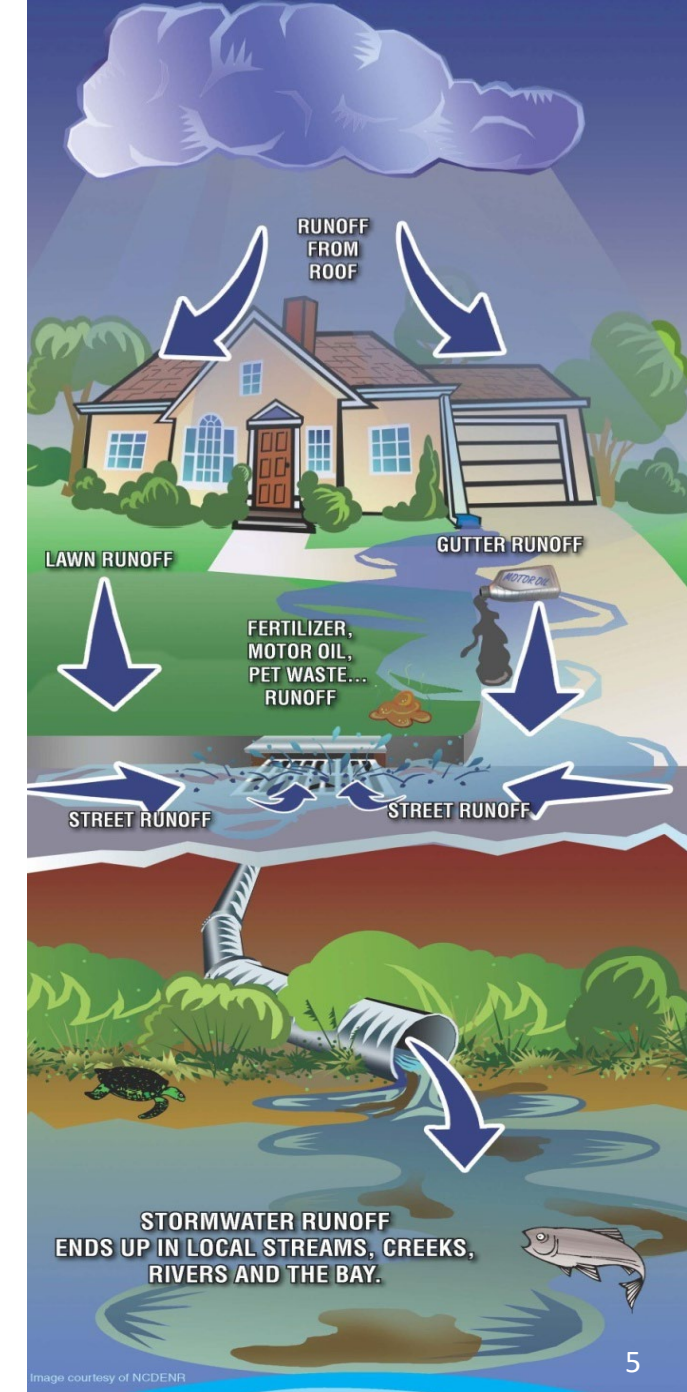
# What is a watershed?

A ***watershed*** is an area from which the water above and below ground drains to the same place.

# What are water quality issues and how does it impact us?

Stormwater pollution happens when rainwater runs over surfaces like roads, rooftops, and lawns. This causes water quality impacts as the rainwater picking up dirt, chemicals, and other harmful substances along the way draining into our streams. Heavy rainfall also causes water quantity issues resulting in stream erosion further impacting water quality and infrastructure and property damages.



RUNOFF FROM ROOF

LAWN RUNOFF

GUTTER RUNOFF

FERTILIZER, MOTOR OIL, PET WASTE... RUNOFF

STREET RUNOFF

STREET RUNOFF

STORMWATER RUNOFF ENDS UP IN LOCAL STREAMS, CREEKS, RIVERS AND THE BAY.

Image courtesy of NCDENR.

# Program Drivers

Federal, State, and Local regulatory requirements and programmatic initiatives:

National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit

- Special Protection Area (SPA)
- No Net Loss of Forest Initiative
- Racial equity and social justice
- Montgomery County Climate Action Plan
- Montgomery County Comprehensive Flood Management Plan

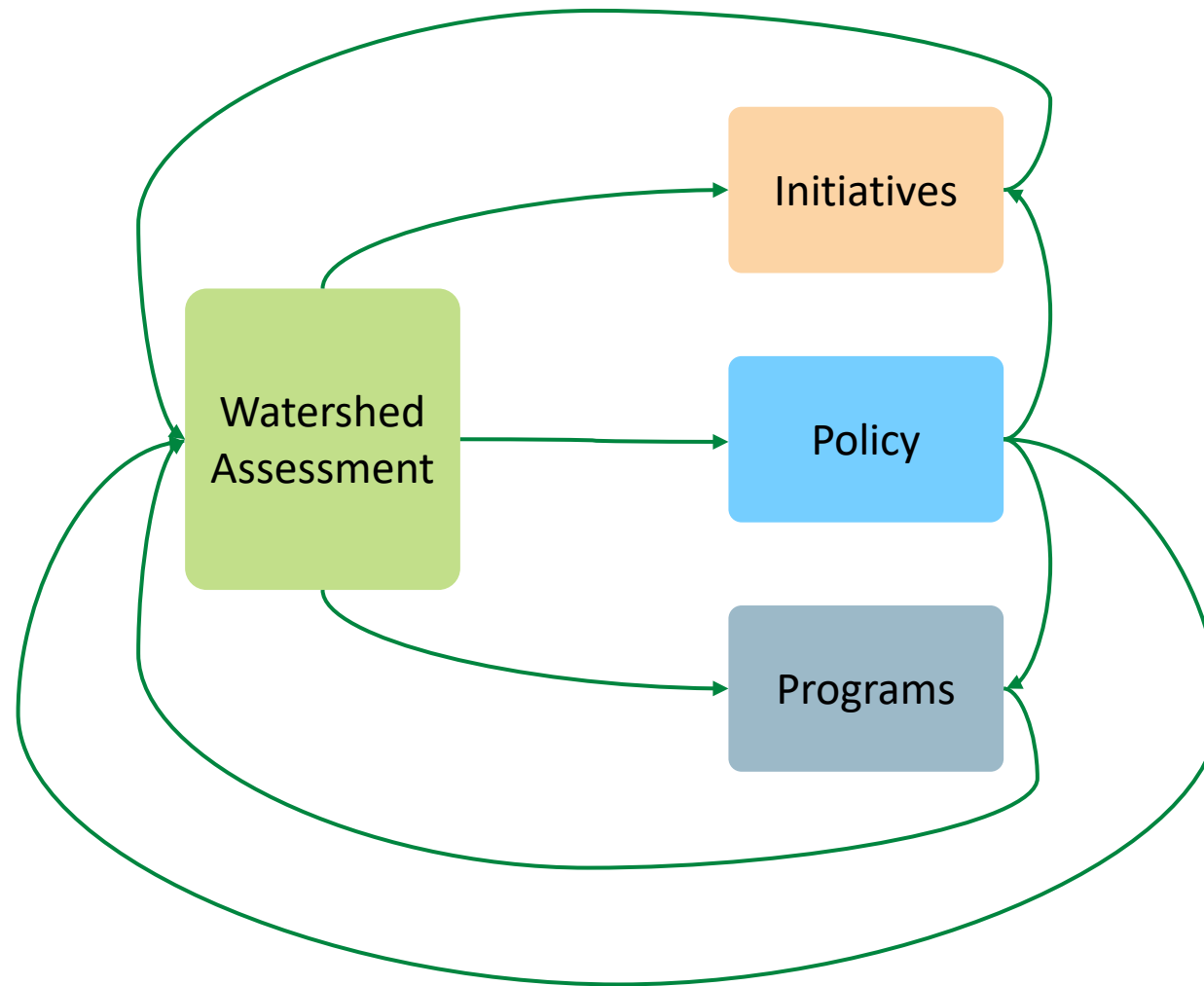# Municipal Separate Storm Sewer System (MS4)
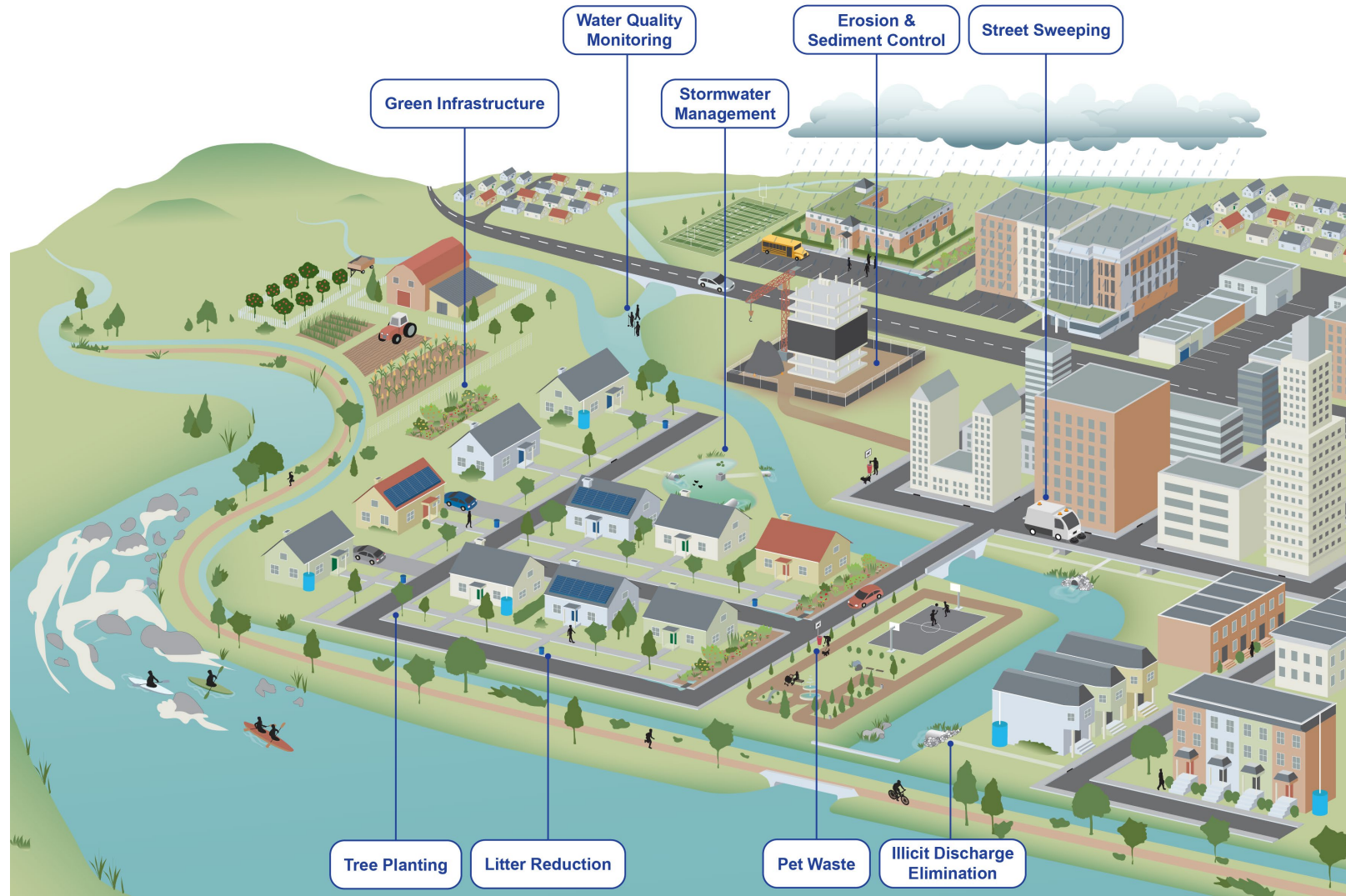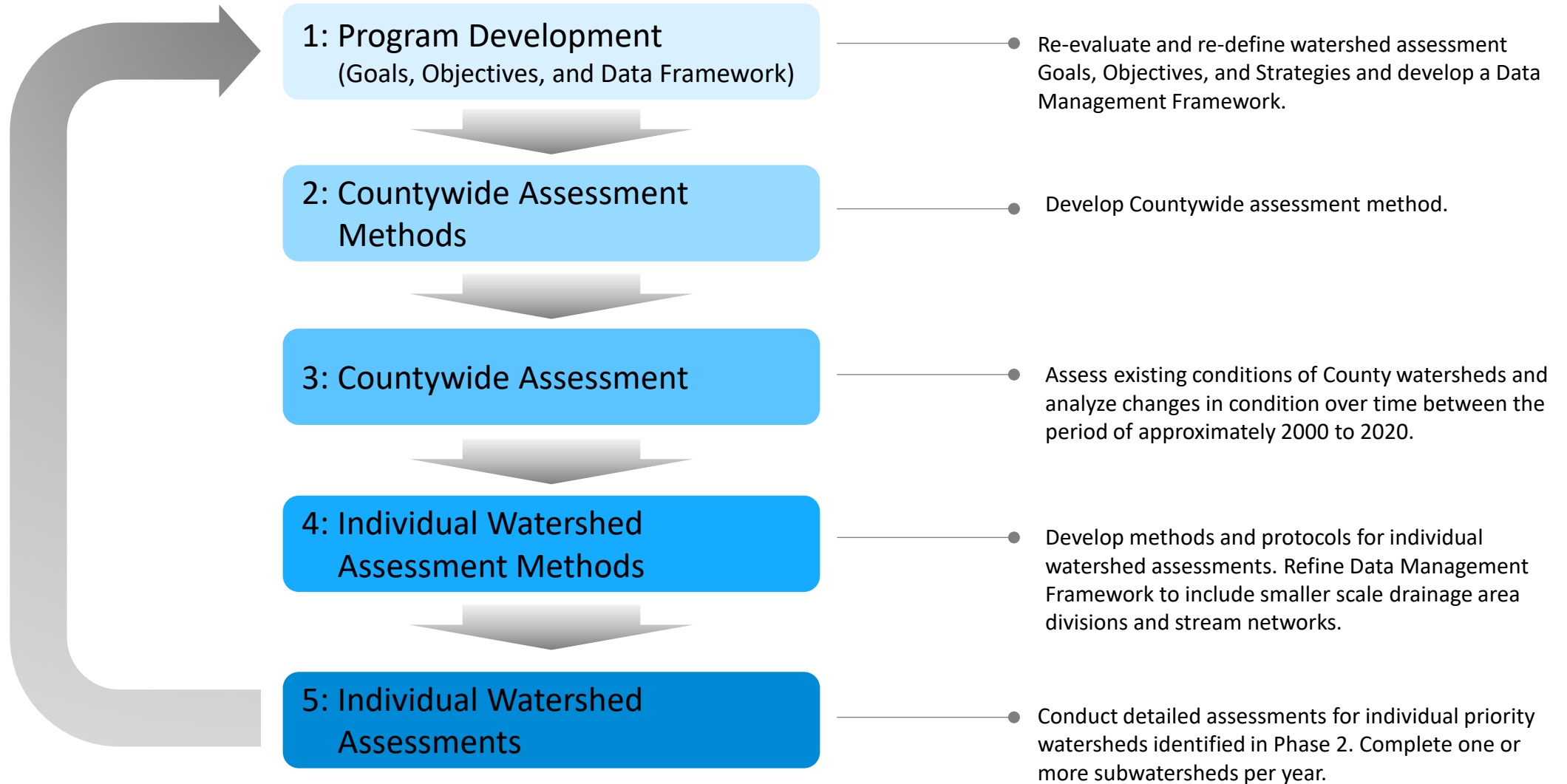
# What is a watershed assessment?

Watershed assessments are like health checkups. Using available information including stream monitoring data (like blood work) to determine the overall condition of the watershed. Where possible, make correlations and provide programmatic recommendations to achieve target goals.
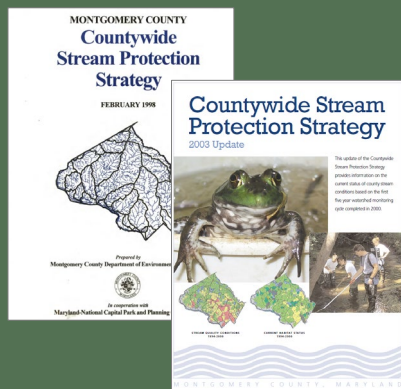
# What is a watershed assessment?

# Phase 1: Program Schedule / Cycle

**1: Program Development**
(Goals, Objectives, and Data Framework)

Re-evaluate and re-define watershed assessment Goals, Objectives, and Strategies and develop a Data Management Framework.

**2: Countywide Assessment Methods**

Develop Countywide assessment method.

**3: Countywide Assessment**

Assess existing conditions of County watersheds and analyze changes in condition over time between the period of approximately 2000 to 2020.

**4: Individual Watershed Assessment Methods**

Develop methods and protocols for individual watershed assessments. Refine Data Management Framework to include smaller scale drainage area divisions and stream networks.

**5: Individual Watershed Assessments**

Conduct detailed assessments for individual priority watersheds identified in Phase 2. Complete one or more subwatersheds per year.

# Phase 1: Program Review and Update (and MS4 Permits)

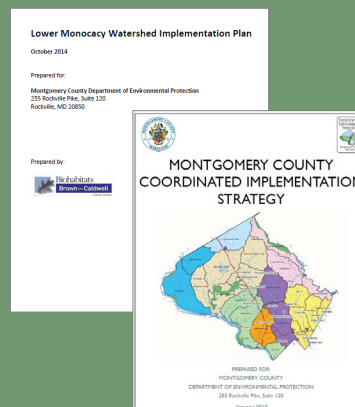## 1998 / 2003 Countywide Stream Protection Strategy



### 1996 MS4 Permit
- No impervious surface restoration (ISR) Goal
- Conduct specific watershed assessments (Little Falls, Sligo Creek,...)

### 2001 MS4 Permit
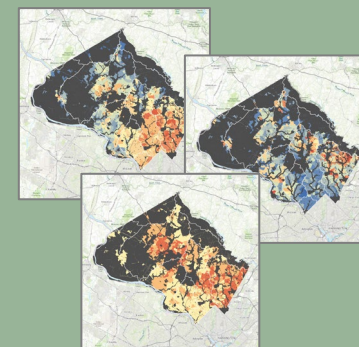- Conduct Countywide assessment and implementation planning
- 10% ISR Goal

## 2012 Countywide Coordinated Implementation Strategy



### 2010 MS4 Permit
- Watershed Assessment (new section in permit)
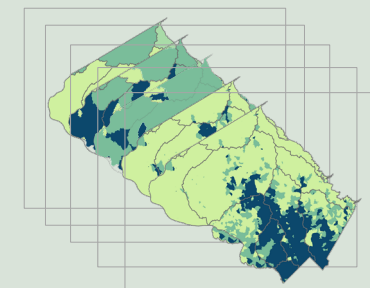- Tie restoration opportunities to Waste Load Allocation (WLAs)
- 20% ISR Goal

## 2018 / 2019 Restoration Suitability Mapping & Demographic Index



### 2021 MS4 Permit
- Maximum Extent Practicable (MEP) Analysis
- Countywide Total Maximum Daily Load (TMDL) Implementation Plan & Annual Progress Update
- ~10% ISR Goal

## Current Watershed Trend Analysis Countywide Assessment



### *Next* MS4 Permit
- Environmental Justice
- Green Infrastructure
- Temperature impact
- Est. 10% ISR Goal

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# Phase 1: Goals

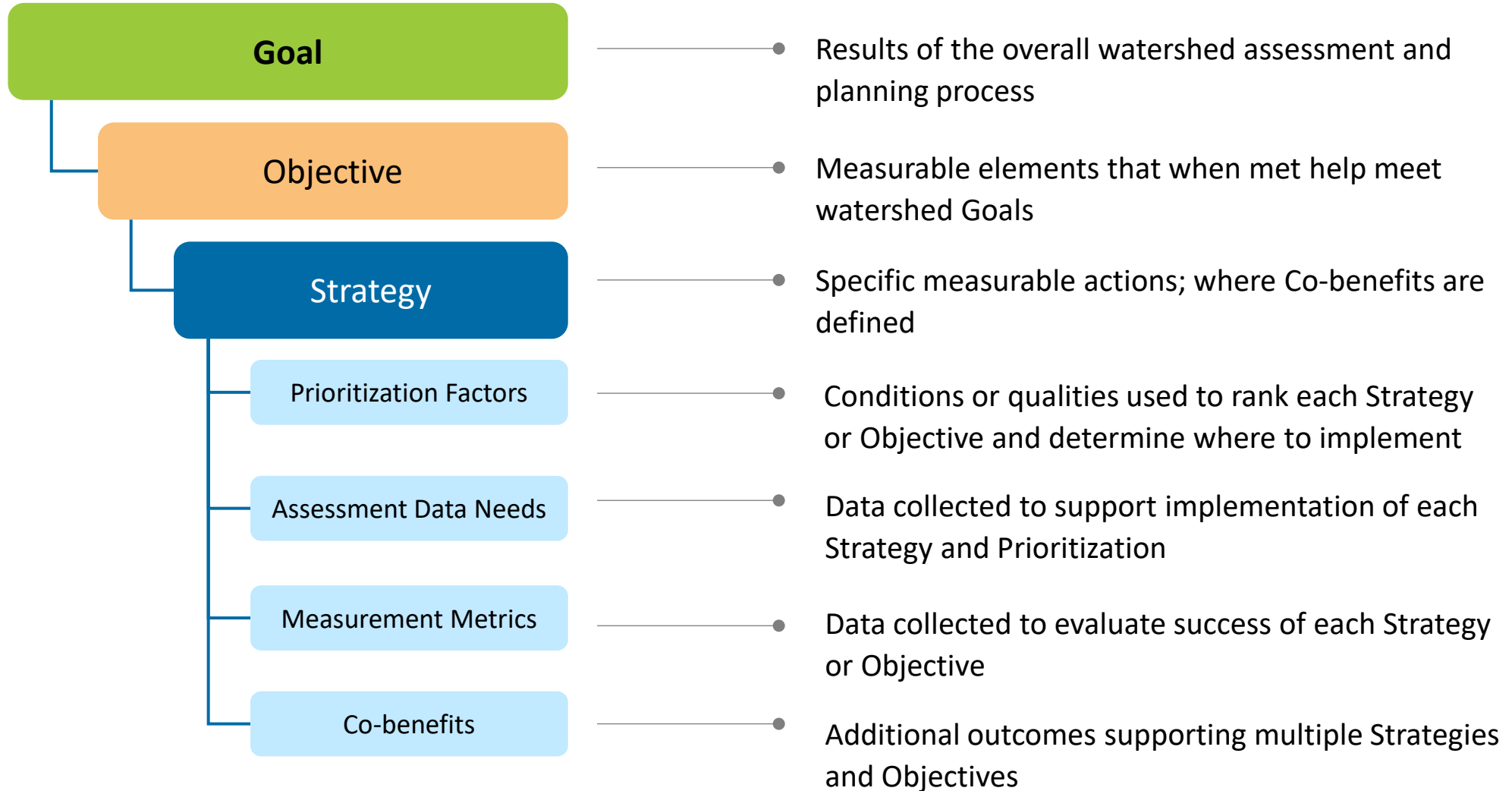| **Water Quality Protection & Improvement** | **Living Resources** | **Land Cover / Land Use** | **Racial Equity Social Justice** | **Climate Change Mitigation and Resilience** | **Erosion and Flood Resilience** |
|---|---|---|---|---|---|
| Reduce levels of pollution in streams and groundwater, including factors such as nutrients, sediment, bacteria, temperature, salt, and toxics. | Maintain and increase the abundance, diversity, and health of the County's native wildlife and plant life. | Reduce levels of pollution in streams and groundwater, including factors such as nutrients, sediment, bacteria, temperature, salt, and toxics. | Consistent with DEP's Racial Equity Vision Statement, DEP's watershed assessments will apply a racial equity lens when setting policies, projects, and programs related to DEP's Mission, ensuring the inclusion of diverse groups, especially frontline/underrepresented communities. | Reduce greenhouse gas emissions, increase carbon sequestration, and adapt to a changing climate. | Prevent and mitigate erosion as well as fluvial and pluvial flooding. |

# Phase 1: Goals & Objectives

**Goal** — Results of the overall watershed assessment and planning process

Objective — Measurable elements that when met help meet watershed Goals

Strategy — Specific measurable actions; where Co-benefits are defined

Prioritization Factors — Conditions or qualities used to rank each Strategy or Objective and determine where to implement

Assessment Data Needs — Data collected to support implementation of each Strategy and Prioritization

Measurement Metrics — Data collected to evaluate success of each Strategy or Objective

Co-benefits — Additional outcomes supporting multiple Strategies and Objectives

# Phase 1: Stakeholder Engagement

# Phase 2 & 3: Countywide Assessment Method & Assessment

## Current

- Assessment of overall County-wide watershed conditions and trends including:
  - Climate / Temperature
  - Land Use / Land Cover
  - Racial Equity & Social Justice
  - Forest Cover
- Utilize recent research:
  *USGS Channel Openness*
- Identify focus areas for a holistic watershed restoration and protection approach.
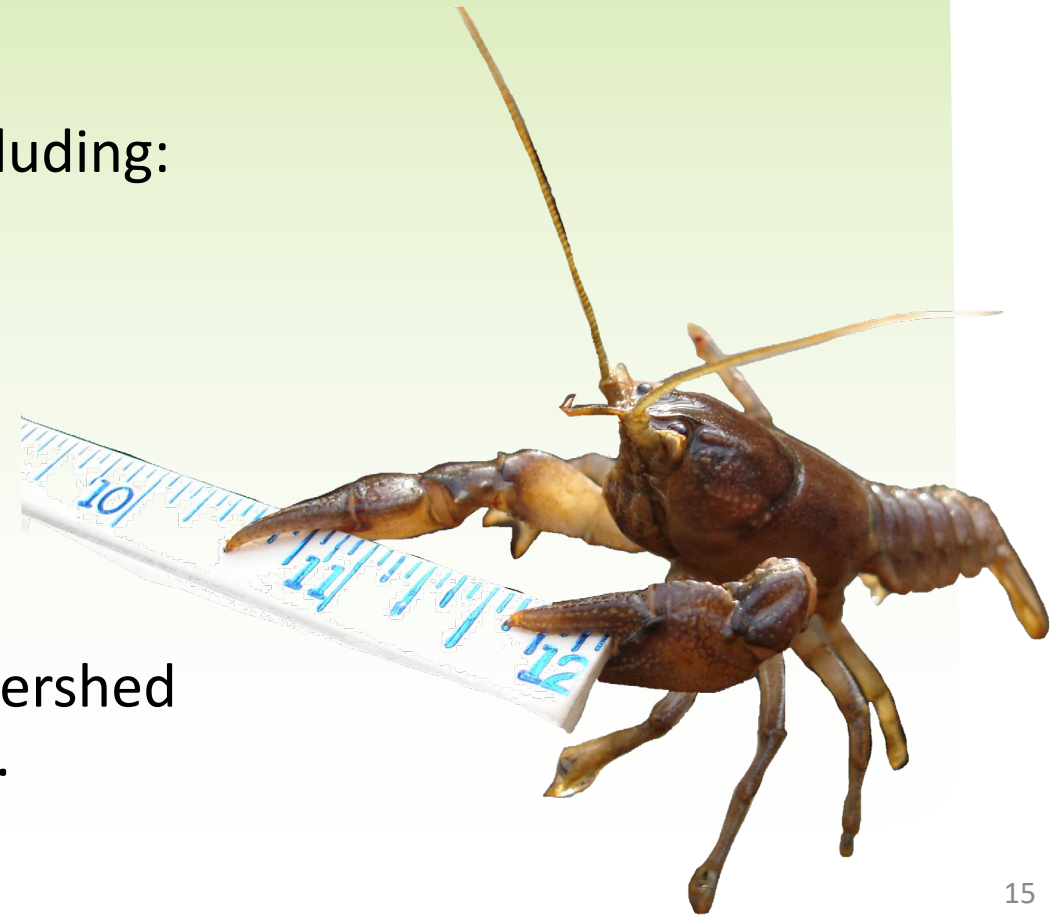
# Phase 2 & 3: Tree Canopy – Forest Cover – Impervious Cover

Tree Canopy (2014 – 2020)

Forest Cover (2008 – 2023)

Impervious Cover (2017 - 2023)

GAIN
LOSS

GAIN
LOSS

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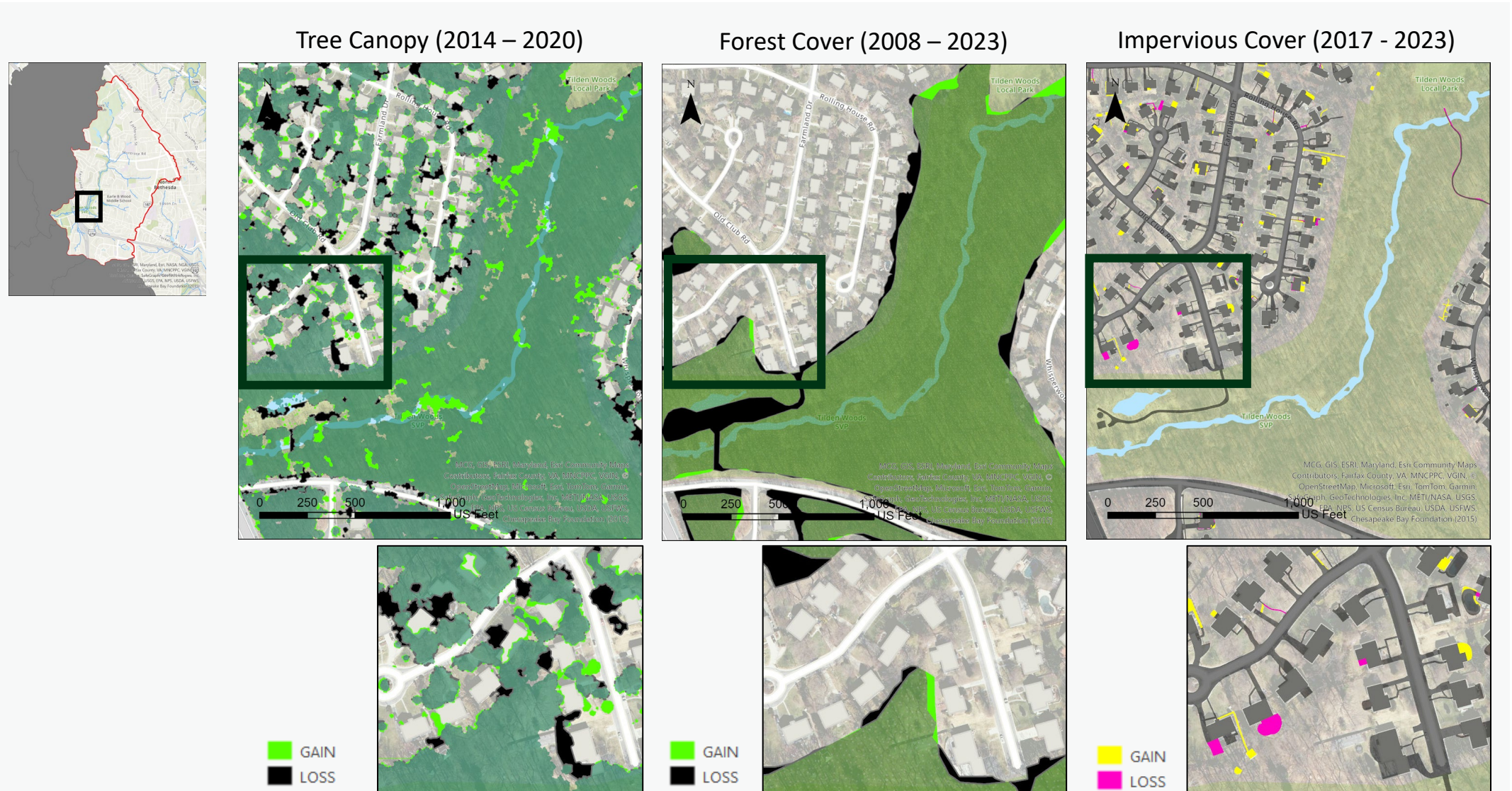
# Phase 2 & 3: Digital Elevation Model Differencing

2017 DEM

2020 DEM

Analysis Result

Deposition

Erosion

# Phase 2 & 3: DEM Differencing and Channel Openness

- USGS Study published in 2024:
  **Remotely mapping gullying and incision in Maryland Piedmont headwater streams using repeat airborne lidar** - Marina J. Metes, Andrew J. Miller , Matthew E. Baker, Kristina G. Hopkins, Daniel K. Jones
  - Topographic openness derived from 1-m lidar to predict incision and change in incision over time.





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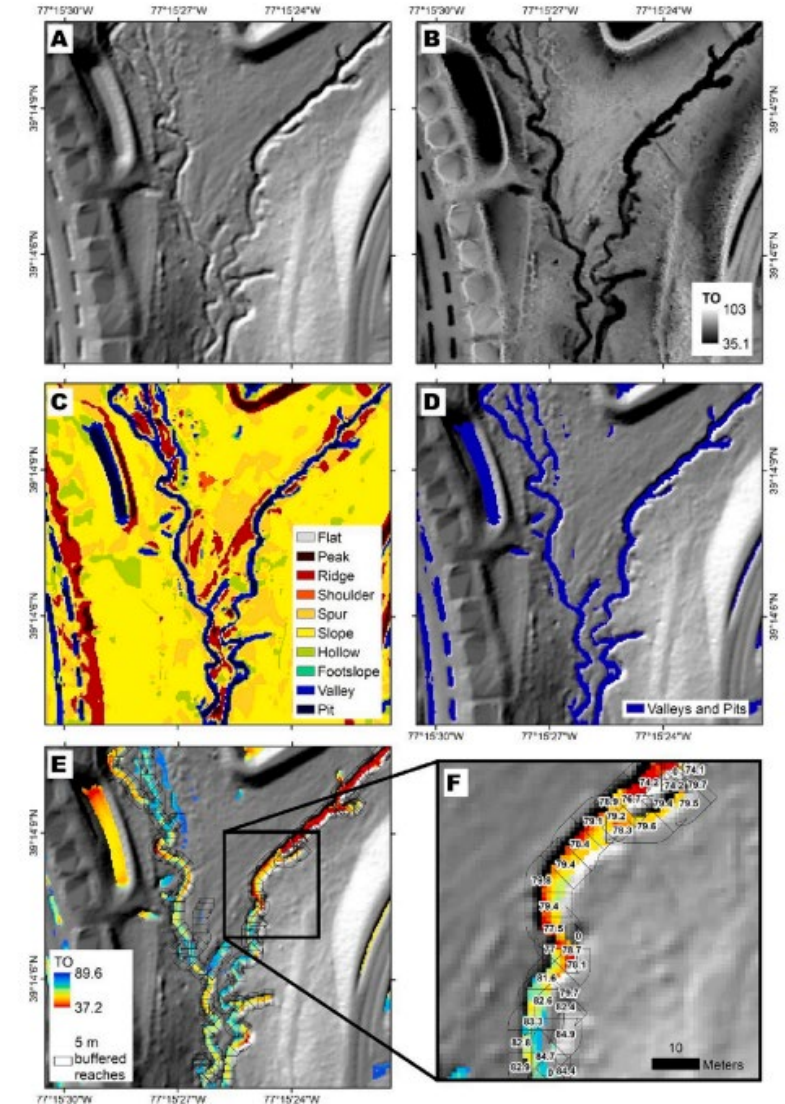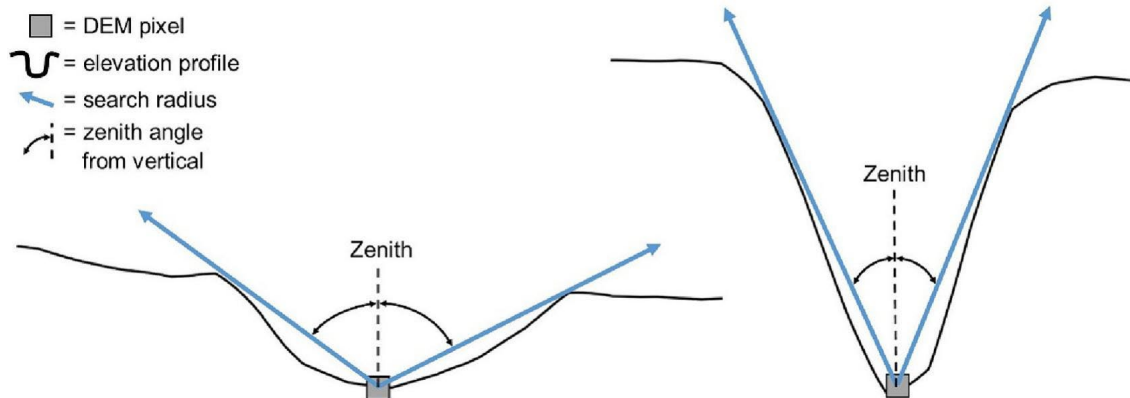
# Phase 2 & 3: Racial Equity and Social Justice
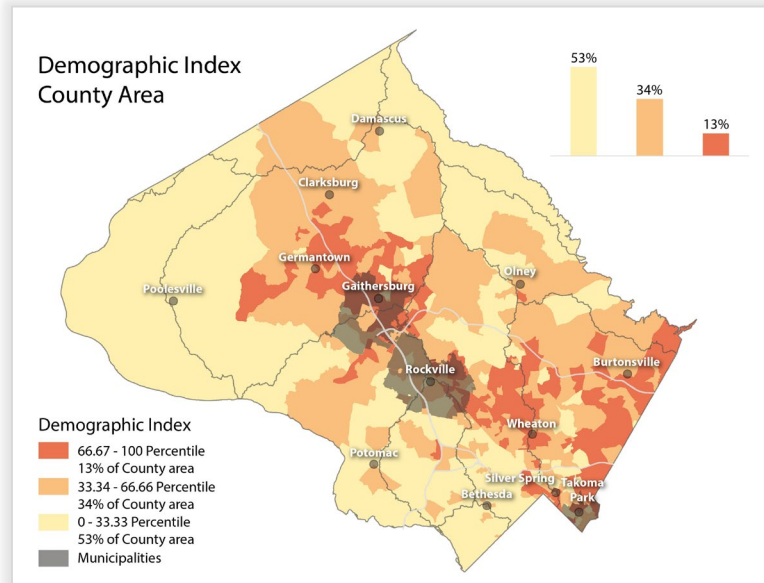


Determining areas of focus based on demographic data and criteria.
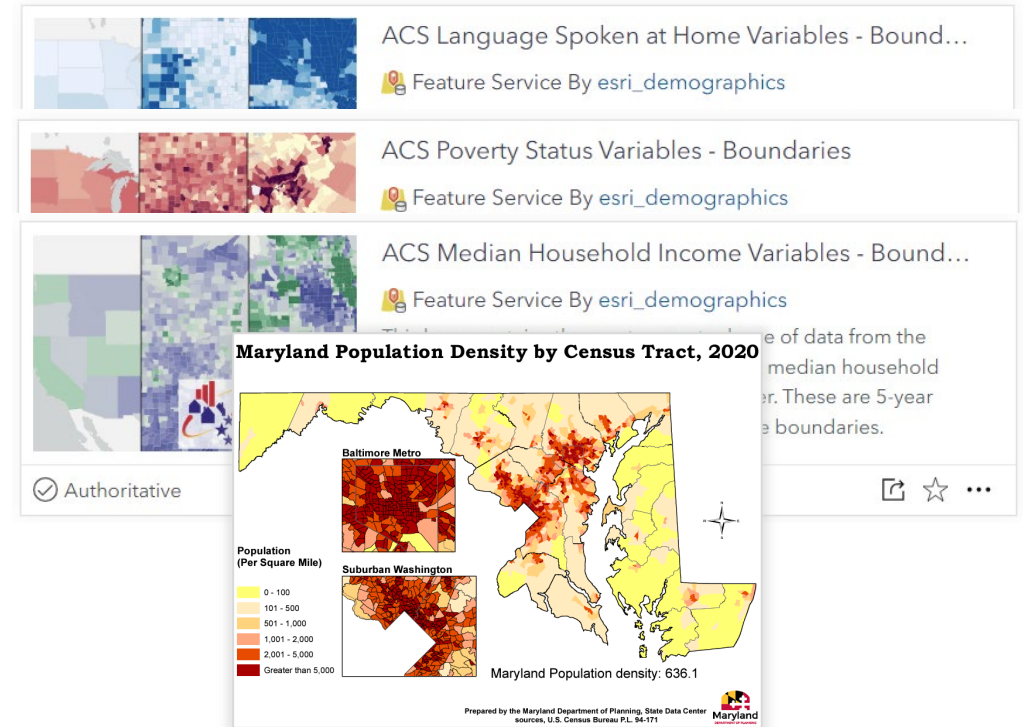


Assess change within Montgomery County and try to determine how communities experience change over time.

# Get Involved: Water Protection & Water Quality Concerns

Report water quality concerns in your community using the online survey.

**https://arcg.is/0KCHPi**

# Thank you!

**Montgomery County Agencies & Departments**

- Department of Environmental Protection (DEP) Watershed Restoration Division
- DEP Energy, Climate and Compliance Division
- DEP Intergovernmental Affairs Division
- DEP Strategic Services Division
- DEP Director's Office
- Department of Transportation (DOT) Division of Transportation Engineering
- DOT Division of Highway Services
- Department of Permitting Services
- Office of Emergency Management and Homeland Security (OEMHS) Operations Division
- OEHMS Administration and Finance Division
- OEHMS Planning Division
- Office of Racial Equity and Social Justice
- Maryland National Capital Park and Planning Commission (M-NCPPC) Montgomery Parks
- M-NCPPC Montgomery Planning

**Maryland State and Regional Agencies**

- Maryland Department of the Environment
- Maryland Department of Natural Resources (MDNR) Fishing and Boating Services
- MDNR Chesapeake and Coastal Services
- MDNR Aquatic Resources
- MDNR Wildlife and Heritage Services
- Maryland Department of Transportation State Highway Administration
- Washington Suburban Sanitary Commission

**Public Watershed Groups and Committees**

- Water Quality Advisory Group
- Climate Action Plan Coalition
- Stormwater Partners Network
- Nature Forward
- Friends of Sligo Creek
- Eyes of Paint Branch
- Little Falls Watershed Alliance
- Seneca Creek Watershed Partners
- Friends of Cabin John Creek
- Sierra Club, Montgomery County Group

# Contact

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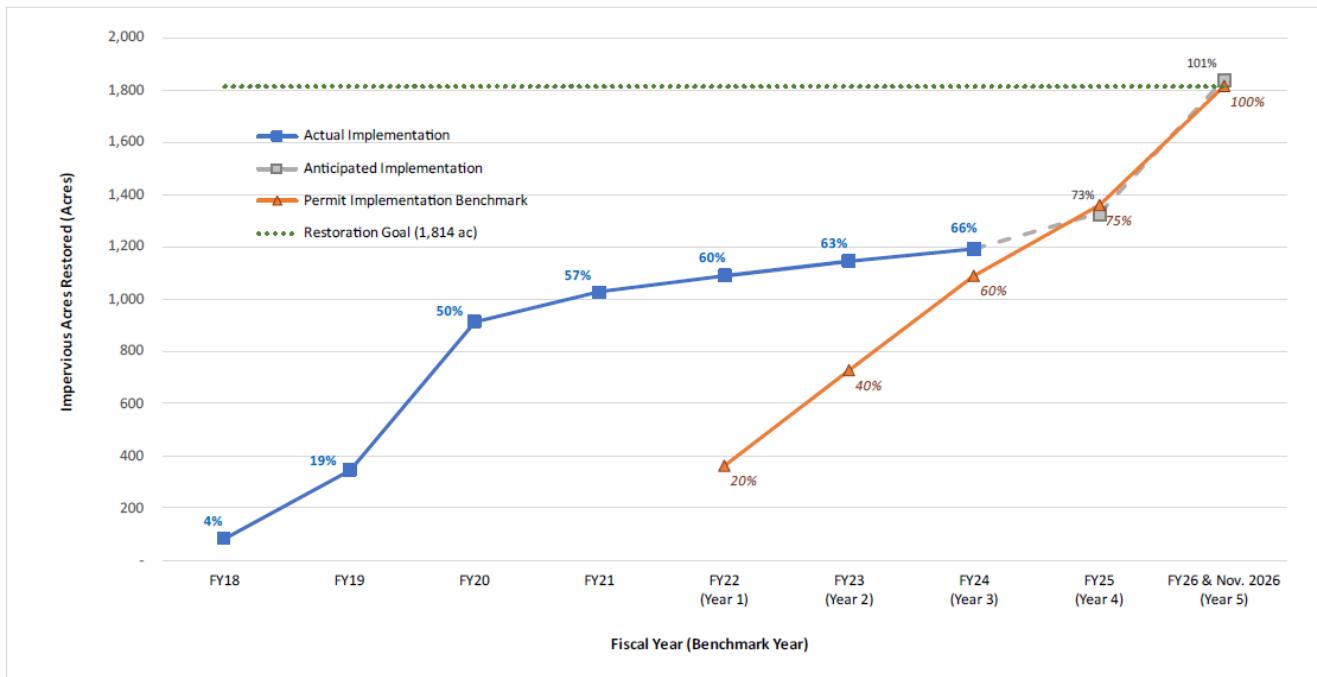Ho-Ching.Fong@montgomerycountymd.gov

# MS4 Update

## Restoration Progress

**FY24 Existing and Expected Progress of Meeting the 2021 Permit Restoration Goal**



## FY24 Reporting

### Good Housekeeping Plan



### Salt Management Plan