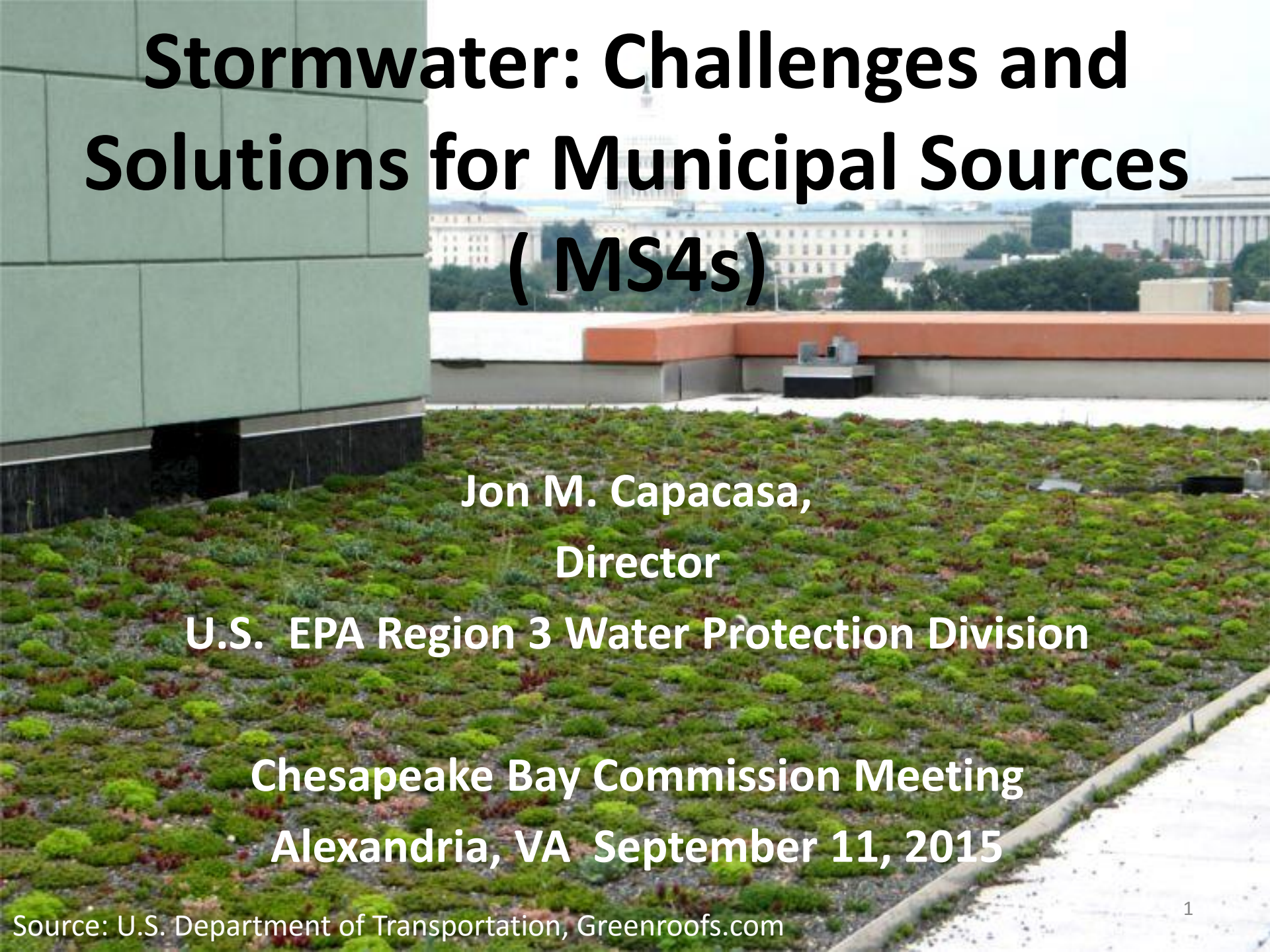
# Stormwater: Challenges and Solutions for Municipal Sources ( MS4s)

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**Director**

**U.S. EPA Region 3 Water Protection Division**


**Chesapeake Bay Commission Meeting**

**Alexandria, VA September 11, 2015**

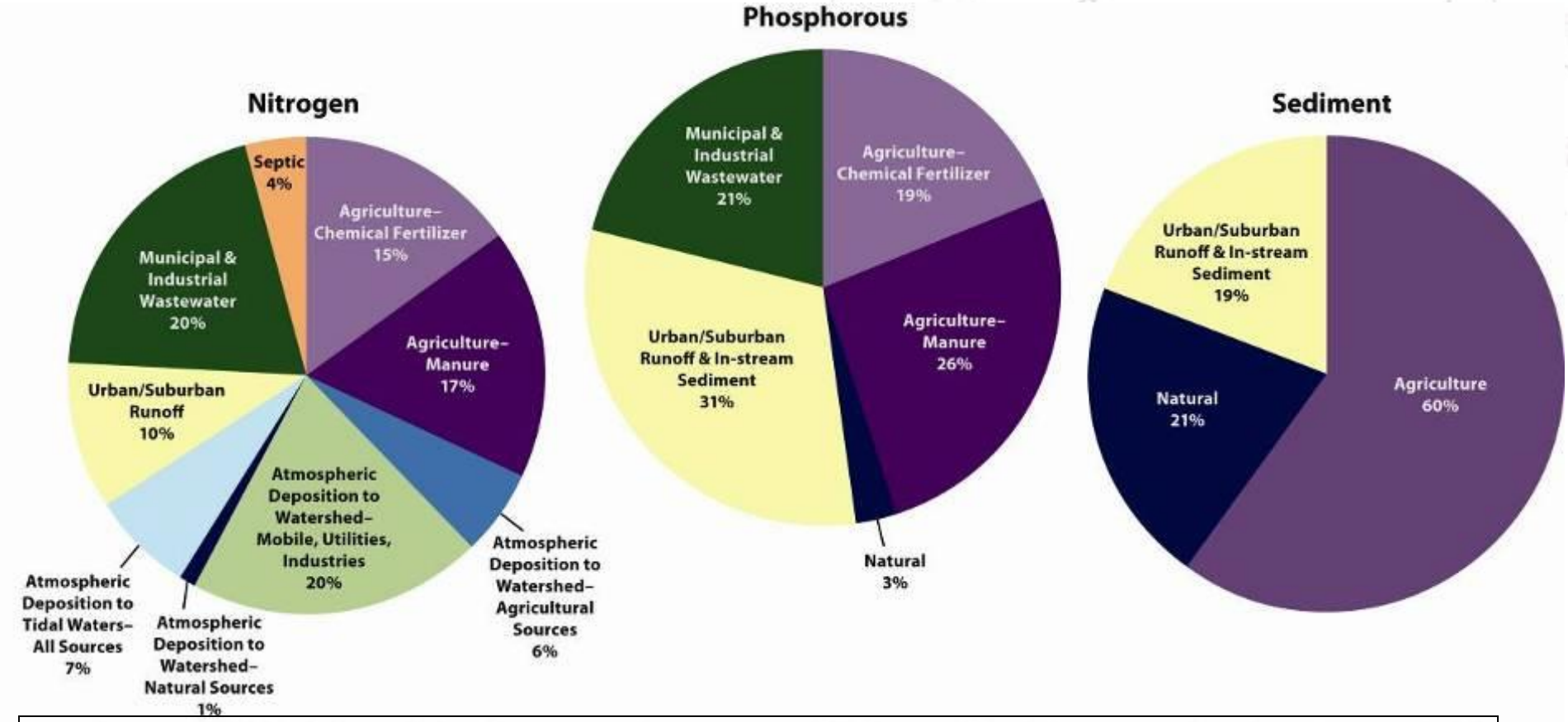
Source: U.S. Department of Transportation, Greenroofs.com

# Stormwater Impacts on the Bay and Local Waters


- Urban stormwater is a leading source of impairment
- Fast growing water quality concern
  - Approximately 800,000 acres being developed every year
  - Development adds impervious areas to the landscape
- A small increase in impervious cover = big impacts in receiving waters
- Development upstream can cause downstream impacts in communities
- Local governments face growing wet weather-related control costs

# Sources of Pollution to the Bay

- **Agriculture** – animal manure, commercial fertilizer
- **Air pollution** – tailpipes, power plants
- **Urban/suburban runoff**– fertilizer, stream erosion
- **Wastewater** – sewage treatment plants




**Note:** Does not include loads from tidal shoreline erosion or the ocean. Urban/suburban runoff loads due to atmospheric deposition are included under atmospheric deposition loads. Wastewater loads based on measured discharges; other loads are based on an average hydrology year using the Chesapeake Bay Program Airshed Model and Watershed Model Phase 4.3 (CBPO, 2009).

# What is an MS4?

*A municipal separate storm sewer system* (MS4) is:

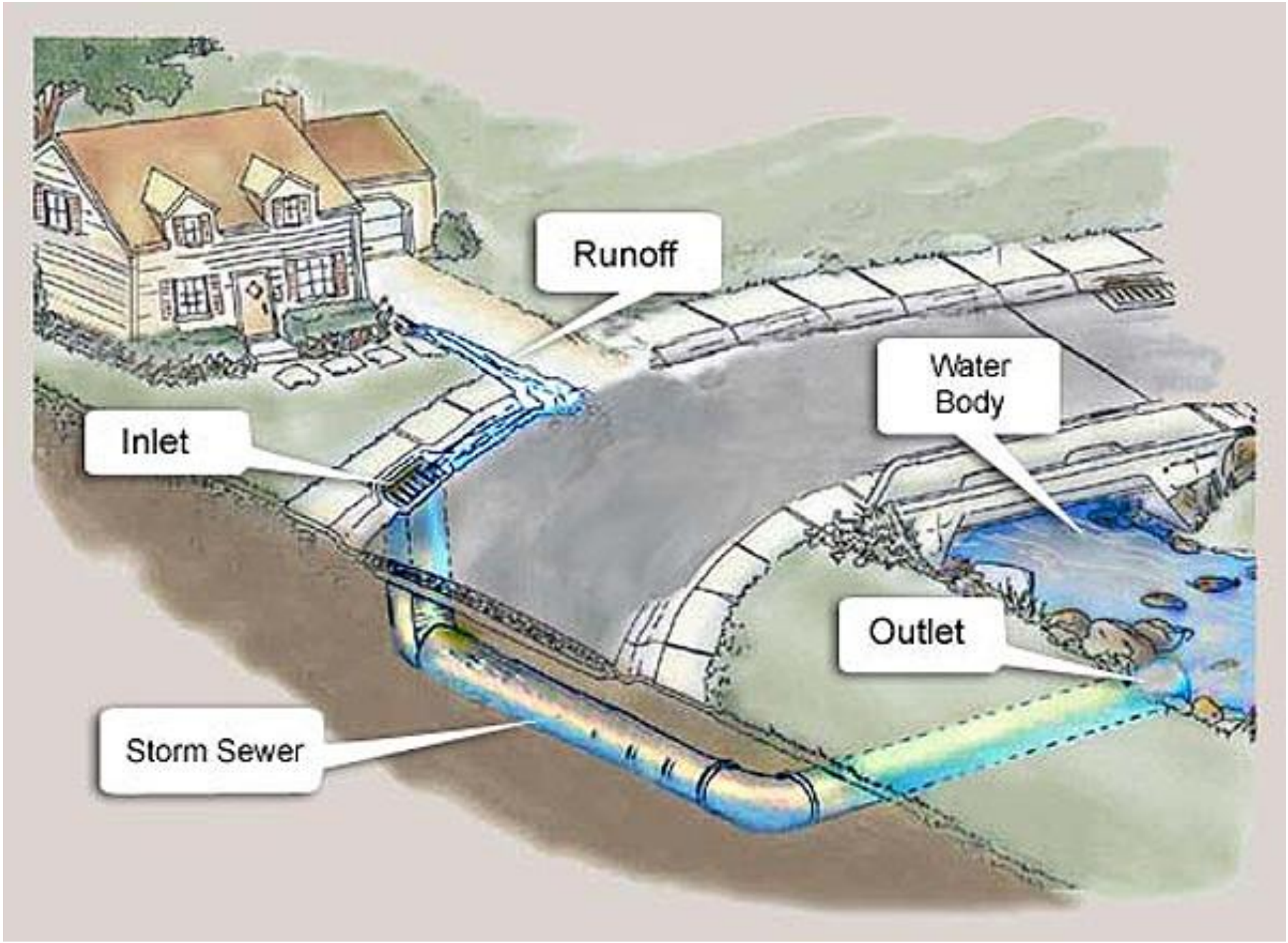
A conveyance or system of conveyances... owned by a State, city, town, or other public entity that discharges to waters of the U.S. and is:

- designed or used for collecting or conveying stormwater (not a combined sewer)
- not part of a Publicly Owned Treatment Works (POTW)

- EPA regulates MS4s using a two-phased approach:

Phase I MS4s – population greater than 100,000 when rule adopted

Phase II MS4s – smaller communities within a designated urbanized area, and updated with each census


Runoff
Water Body
Inlet
Outlet
Storm Sewer

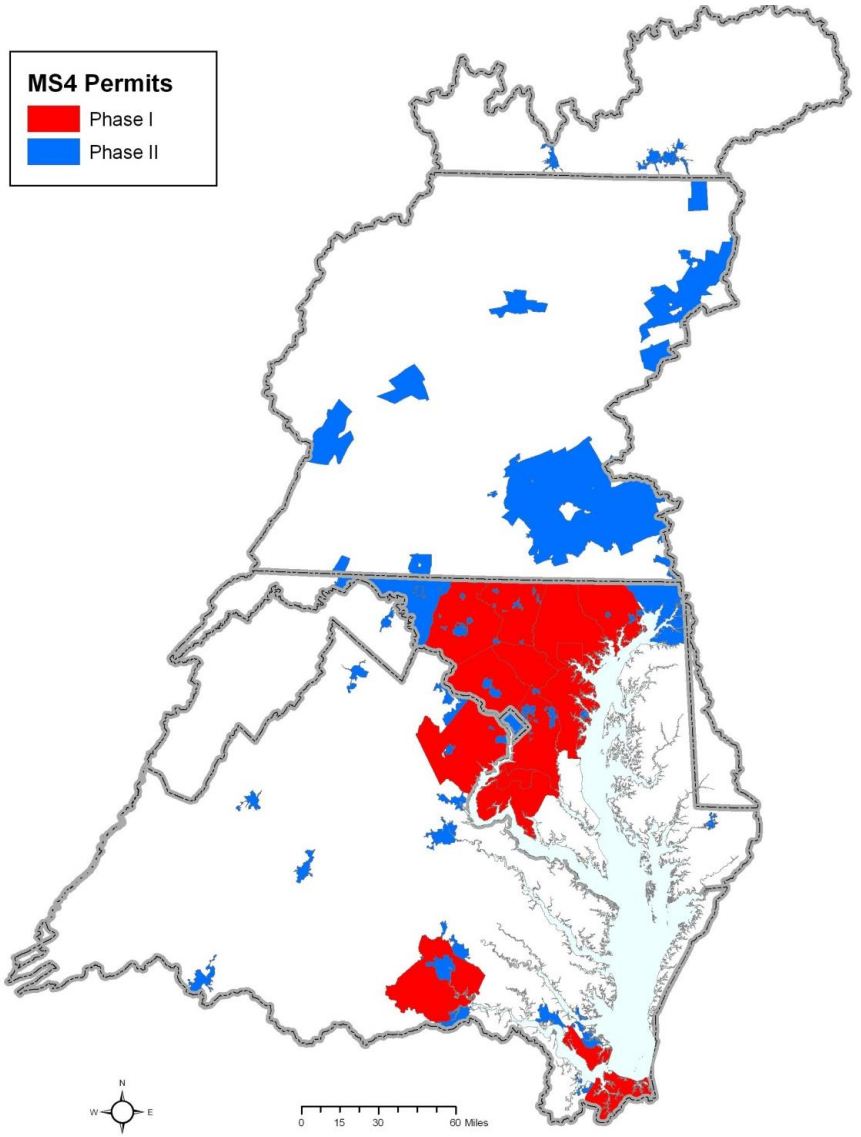
# Elements of the MS4 Program


- Public Education and Outreach
- Public Involvement/Participation
- Illicit Discharge Detection & Elimination
- Construction Site Stormwater Runoff Control
- Post-Construction Stormwater Management
- Pollution Prevention/Good Housekeeping
- Industrial/Commercial Monitoring (Phase I only)

# Status of Renewal of MS4 Permits

## R3 MS4 Permit Renewals

- 16 of 24 Phase I permits in Bay Watershed recently reissued
  - Pending are:
    - VA Tidewater permits
    - MD SHA and Montgomery Co.
- 3 of 5 Phase II State-wide General Permits reissued
  - MD & DE permits were submitted to EPA and reviewed. Expect issuance by end of 2015
- About 450 Phase II permittees in the Bay watershed (more expected as a result of 2010 census)



# Phase II WIP Commitments: State by State Load Reductions from 2009 to 2025

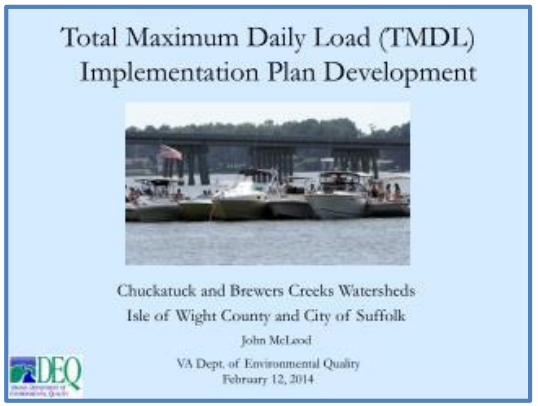
| | % Reduction in Statewide Loads | | | % Reduction in Urban Loads | | | % Total Load Reductions Attributable to Urban Sector | | |
|---|---|---|---|---|---|---|---|---|---|
| | N | P | TSS | N | P | TSS | N | P | TSS |
| Delaware | 26% | 31% | 27% | 13% | 12% | 5% | 4% | 2% | 5% |
| D.C. | 19% | -68% | 5% | 13% | 22% | 16% | 5% | N.A. | 255% |
| Maryland | 21% | 20% | 16% | 24% | 28% | 29% | 21% | 30% | 66% |
| New York | 13% | 30% | 25% | 8% | 20% | 10% | 7% | 9% | 12% |
| Pennsylvania | 30% | 29% | 28% | 41% | 45% | 50% | 20% | 24% | 39% |
| Virginia | 18% | 25% | 24% | 13% | 21% | 30% | 10% | 14% | 23% |
| West Virginia | 8% | 31% | 32% | 3% | 44% | 50% | 6% | 18% | 37% |

Negative values indicate increases in loads from 2009 to Phase II WIP planning targets, typically due to increases in wastewater treatment flow up to design capacity.

# MS4 Permit Requirements
# 2010 Region 3 Stormwater Approach

**EPA CLARIFIED WHAT STATES SHOULD INCLUDE WHEN RENEWING MS4 PERMITS:**

+ CLEAR, MEASURABLE PROVISIONS – ENFORCEABILITY
+ ACCOUNTABILITY MECHANISMS
+ POST-CONSTRUCTION PERFORMANCE STANDARDS
+ RETROFITTING REQUIREMENTS
+ PLANS TO IMPLEMENT TMDL ALLOCATIONS (WATER QUALITY BASED PERMITS)
+ WATER QUALITY TRADING PROVISIONS
+ CONSIDERATION OF FEDERAL FACILITIES




# Improvements in R3 MS4 Permits

**State Highlights:**

- **MD** – **20% restoration** of regulated impervious surface area in one permit term; requirement for use of Environmental Site Design
- **VA** – phased approach to achieve Bay WIP **reductions in 3 permit terms (5% load reduction in first term)**
- **PA** – newly required Bay TMDL **pollutant reduction plans**
  - A commitment to enhance the Phase II Permit in next round by including numeric pollutant reductions; early start on next round of permits.

**TMDL/restoration Plans must incorporate annual compliance milestones and deadlines

# Improvements in R3 MS4 permits

**State Highlights:**

- **DC** (EPA-issued MS4 permit)
  - New On-site retention performance standard – **90% storm capture (1.2”) for new or redevelopment**
  - Enforceable Green provisions (i.e. tree plantings, green roof acres, etc.)
  - Innovative storm water retention credit trading program; **new City-wide regulations**
- **WV** – capture **85% of storm runoff -** performance standard for all Phase II permittees
- **DE** – **3% decrease:** untreated effective impervious area

# Compliance/Enforcement

- EPA has been active in audits/inspections of MS4s
  - 26 Phase I's and 47 Phase II's inspected since 2008
  - More Annual Report and File Reviews conducted
  - High rate of non-compliance, but recently improving
  - Compliance Orders and Penalties for significant issues

- State-wide Stormwater program assessments were performed for each R3 jurisdiction/state

- Conducted MS4 Permittee and Inspector Training on various occasions
  - 150 attended VA MS4 Forum this spring!
  - State and National Inspector trainings - PA, VA, and Baltimore (national)
  - Sharing lessons learned from audits, peer to peer exchange

# Implementation Challenges

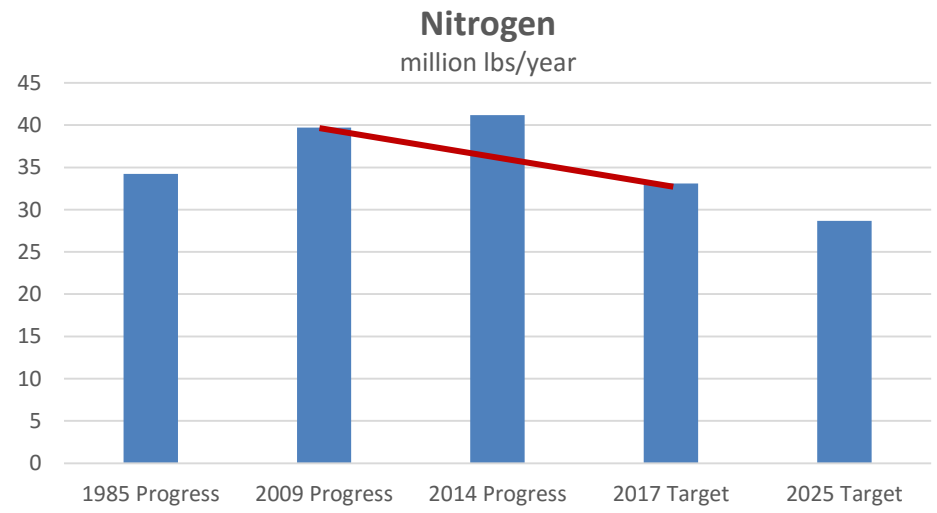
- **Legal Appeals Slow Permitting Pace**
  - Lost full permit cycle +
  - The pace to meet our 2025 goals
- **The Cost of Retrofits**
  - WQ improvements require progress in the built environment
  - Most costly BMPs; savings possible when part of ongoing redevelopment
  - GI and new financing tools have promise here
- **State Program & Local Gov't Capacity** (Funding/Financing)
  - Baseline is a low rate of compliance
- **Ambitious allocations** to this source
- **Reducing the appropriate sediment source**
  - Overland flow vs in-stream scouring

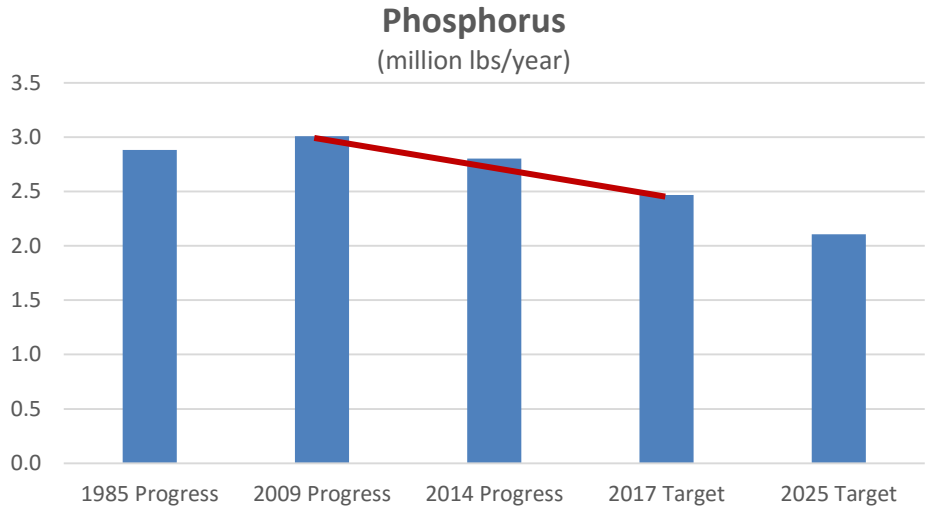
# EPA Oversight of WIPs/Milestones

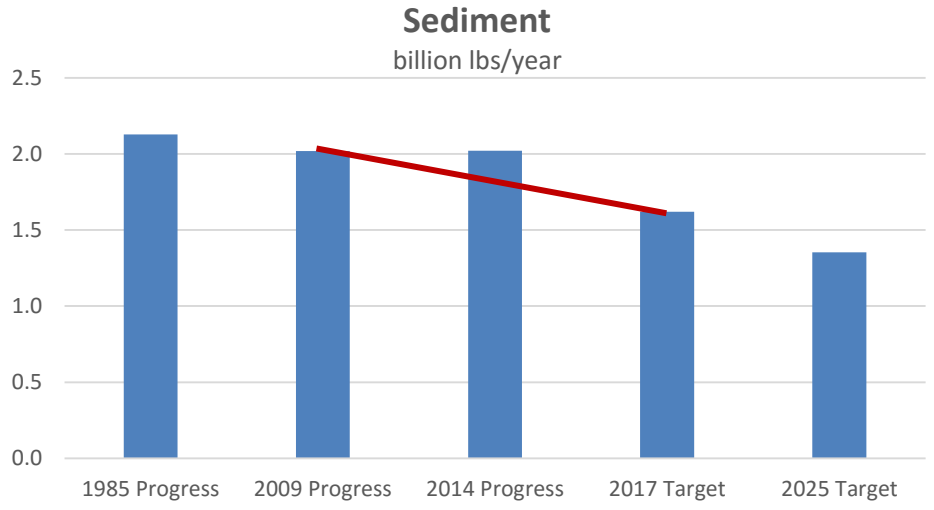
| | Agriculture: | Urban/Suburban: | Wastewater: | Trading/Offsets: |
|---|---|---|---|---|
| DE | Ongoing Oversight | Ongoing Oversight | Enhanced Oversight | Ongoing Oversight |
| DC | Not Applicable | Ongoing Oversight | Ongoing Oversight | Ongoing Oversight |
| MD | Ongoing Oversight | Ongoing Oversight | Ongoing Oversight | Ongoing Oversight |
| NY | Ongoing Oversight | Ongoing Oversight | Enhanced Oversight | Ongoing Oversight |
| PA | Backstop Actions Level | Backstop Actions Level | Ongoing Oversight | Enhanced Oversight |
| VA | Ongoing Oversight | Enhanced Oversight | Ongoing Oversight | Ongoing Oversight |
| WV | Enhanced Oversight | Ongoing Oversight | Ongoing Oversight | Ongoing Oversight |

Green fading to yellow indicates potential downgrade at end of 2014-2015 milestone period if specific actions are not taken

# Faster Pace Needed for Urban/Suburban Sector




Source: Chesapeake Bay Program (April 2015)

# Issue Brief – State Permit Status

- Will MS4 Permits deliver the pollution reductions planned in state Watershed Implementation Plans by 2025?

- MD, PA, VA status (see briefing paper)

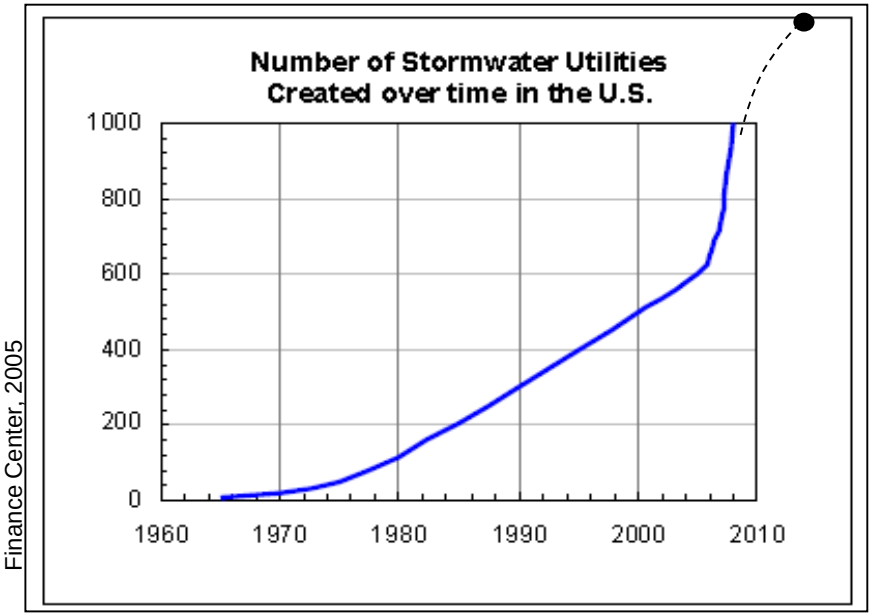
# Funding Options for MS4s

- Traditional Funding Types:
  - Dedicated general funds
  - In-lieu programs
  - Grants
  - Special service districts
  - Municipal bonds
  - User-based fee

- Non-traditional Funding/Financing Types:
  - Market-based Approaches – Trading and Offsets
  - Clean Water State Revolving Funds (SRF)
  - Community Based Public-Private Partnerships (CBP3s)

# Stormwater Utilities – A National View

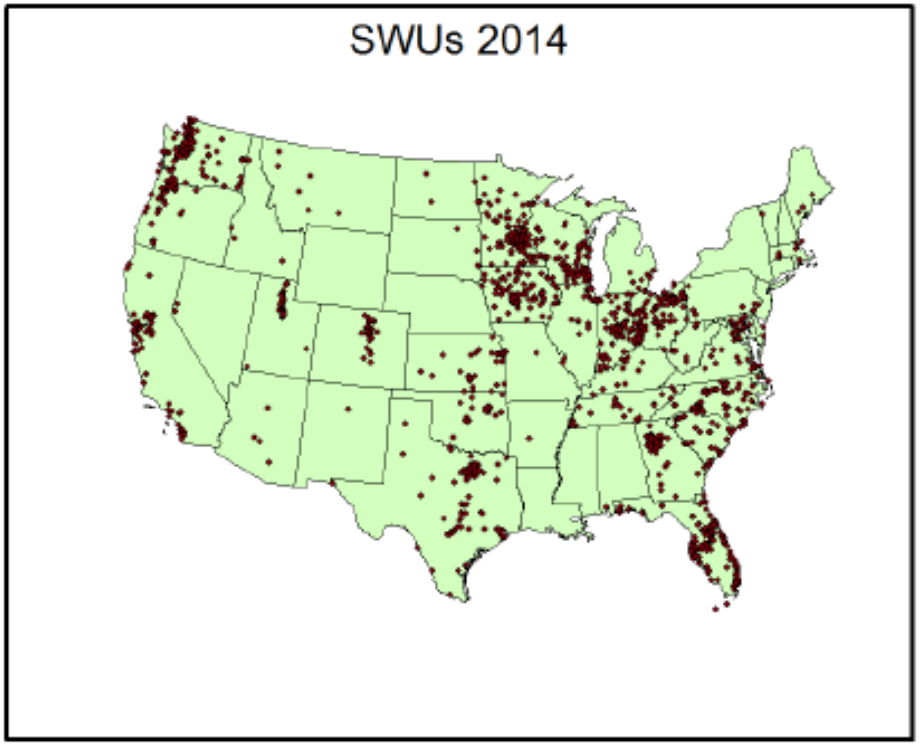
~1,500 today



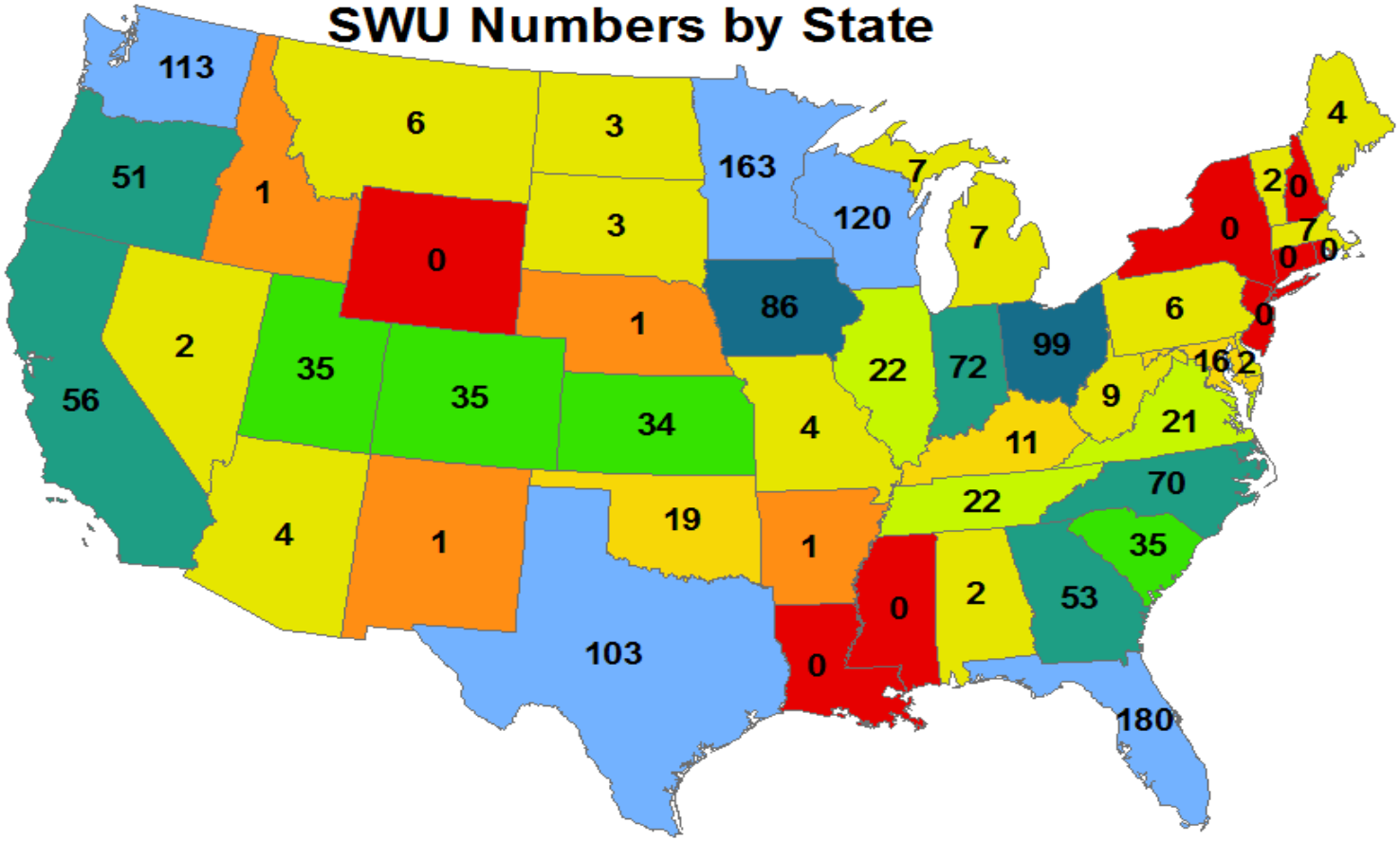

U.S. EPA, 2009, New England Environmental Finance Center, 2005

## National Coverage

- Virginia has 21 SWUs




Western Kentucky University, 2014




Western Kentucky University, 2014

# EPA Region 3 Focus

- "Faster, Cheaper, Greener" Solutions for Communities
  - Green Infrastructure (GI)
  - New Financing tools
  - Retrofit Cost Reduction
- A "Center of Excellence" for GI

# The $G_3$ Initiative
## Green Streets, Green Jobs, Green Towns

- EPA Region 3 program begun in 2011 - (Chesapeake Bay Trust and MD DNR as partners)
- Over **60 local government grants** awarded between 2001-14; in every state in R3
- Investing over **$4.9 Million** into green initiatives from the partners resulting in over **$9 Million** in projects
- Enhancing quality of life in communities while meeting our stormwater goals

# Addressing Urban Stormwater- Green Streets, Green Jobs, Green Towns

- **Urban Stormwater Runoff**
  - Growing sector in loading
  - Seeking "Faster, Cheaper, Greener" solutions for cities to meet the challenge
- **EPA "Green Streets"**
  - A sustainable stormwater management strategy that also contributes to community redevelopment

- **Multiple benefits**
  - Avoided stormwater treatment costs
  - Reduced flooding
  - Reduced energy costs (green roofs, tree canopy)
  - Pedestrian/ biking access
  - Air-quality improvements
  - Heat island impacts
  - Increased home values
  - Habitat benefits

# GI and Financing

- CBP3 – Community Based **Public-Private-Partnerships**
- Using **Credit/Offset programs** in urban areas to drive private investment
- **Certification program** development to promote green designs (LEED-like programs)

# GI and Financing – The CBP3

- **Community Based Public-Private Partnerships** (CBP3)
- "**Faster-Cheaper-Greener"** Webcast Series
- **Seeking demonstration communities across the Region**
    - Prince Georges County and others
- A **"Guide for Local Governments"** is available from EPA Region III

# 1st Stormwater CBP3 Demonstration Pilot !

## USEPA Press Release January 10, 2014

**EPA, MDE, Prince George's County Announce Public, Private Partnership Model to Accelerate Green Stormwater Controls and Support Local Job Creation**

(WASHINGTON – January 10, 2014)

The U.S. Environmental Protection Agency, Maryland Department of Environment (MDE) and Prince George's County today announced a $100 million initiative to demonstrate how community-based, public-private partnerships can spur green infrastructure-driven stormwater controls, while creating thousands of local jobs and boosting economic growth.

EPA and MDE have joined forces with Prince George's County to provide technical and regulatory support for developing and implementing the Prince George's County Urban Stormwater Retrofit Public-Private Partnership Demonstration Pilot. ...

# Community-Based Public Private Partnerships (CBP3) for achieving affordable GI-Driven SW Retrofits…

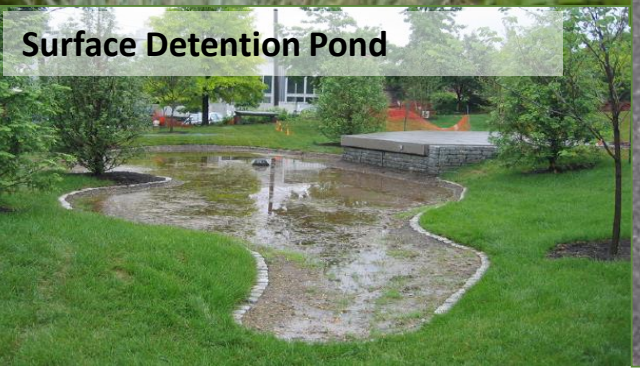
***A partnership with the private sector designed to:***

- ☑ Provide greater delivery & capacity for market-based approaches; Accelerate the pace
- ☑ Create economic feasibility;
- ☑ Better leverage local government resources;
- ☑ Foster improved, affordable GI BMPs;
- ☑ Expedite project delivery over the long term (O&M);
- ☑ Spur local economic development;
- ☑ Show transparency for community;
- ☑ Drive down costs; and,
- ☑ Sustained regulatory compliance.

# Stormwater Fee Credits

Phila offers up to 80% Fee Credit for the Management of 1” of stormwater





# Market-based Approaches

- Stormwater Volume Trading
  - District of Columbia's Stormwater Retention Credit (SRC) program
  - Half on-site control required, rest can be purchased
  - Credit buyers in urban core, credit generators in outlying urban districts
  - Can lead to social and environmental benefits and economic efficiencies
  - First trade occurred in September, 2014!!!

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