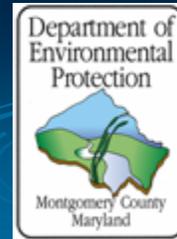


Landscape Professionals Training

Montgomery County LID Stormwater Facility Maintenance and RainScapes

Hydrology 101

January 23, 2013



Introductions and Agenda

- **What to expect today:**
 - Watershed Issues in Montgomery County – Why Here, Why Now?
 - RainScapes Program Overview and Update on Rewards Levels
 - Essential Elements of ESD/LID
 - Stormwater Facility Maintenance
 - Resources, Future Training and Events
 - Discussion

What is Stormwater?

Stormwater is RAIN and SNOWMELT that flows across the landscape during precipitation events. Water that does not soak into the ground becomes **stormwater runoff**. This runoff flows over hard surfaces like rooftops, driveways and parking lots collecting sediment, pollutants, and trash, and flows:

- Directly into streams
- Into storm drain pipes, eventually leading to streams
- Into stormwater management facilities, then streams

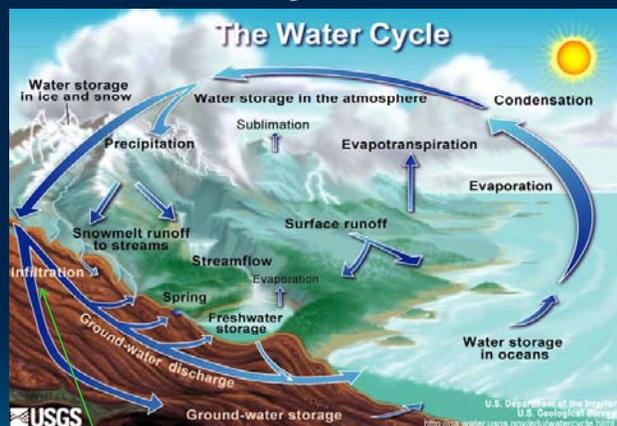
We are responsible for:

- What goes into our storm drain pipes
- What comes out of them
- What flows into the streams

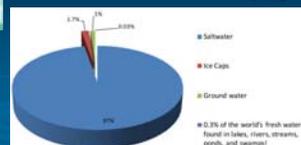


Two Major Issues:
Flow Volume and Timing of Runoff
Water Quality

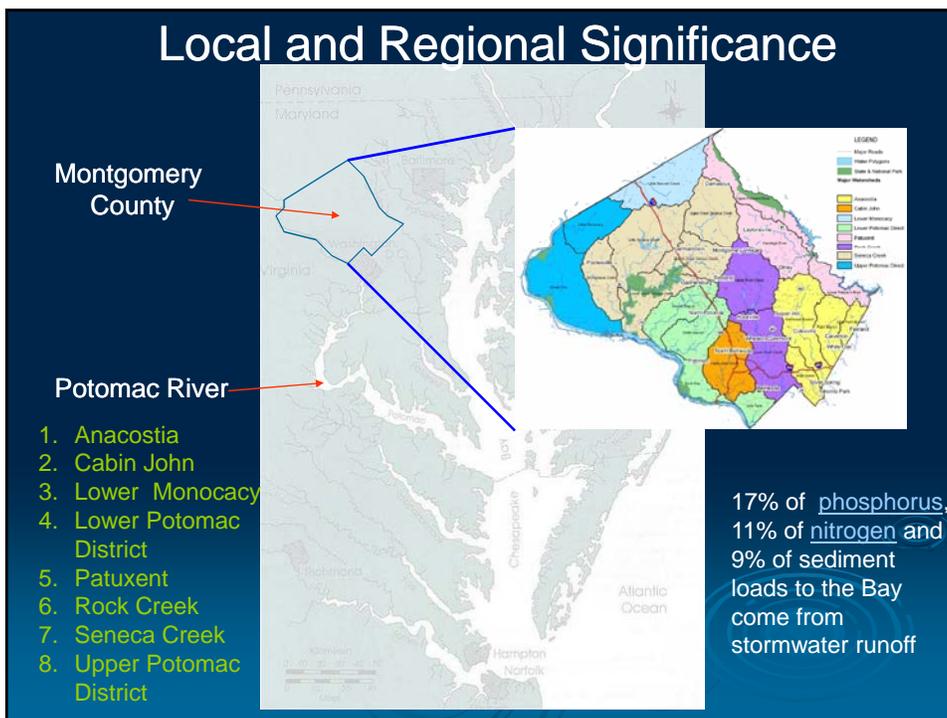
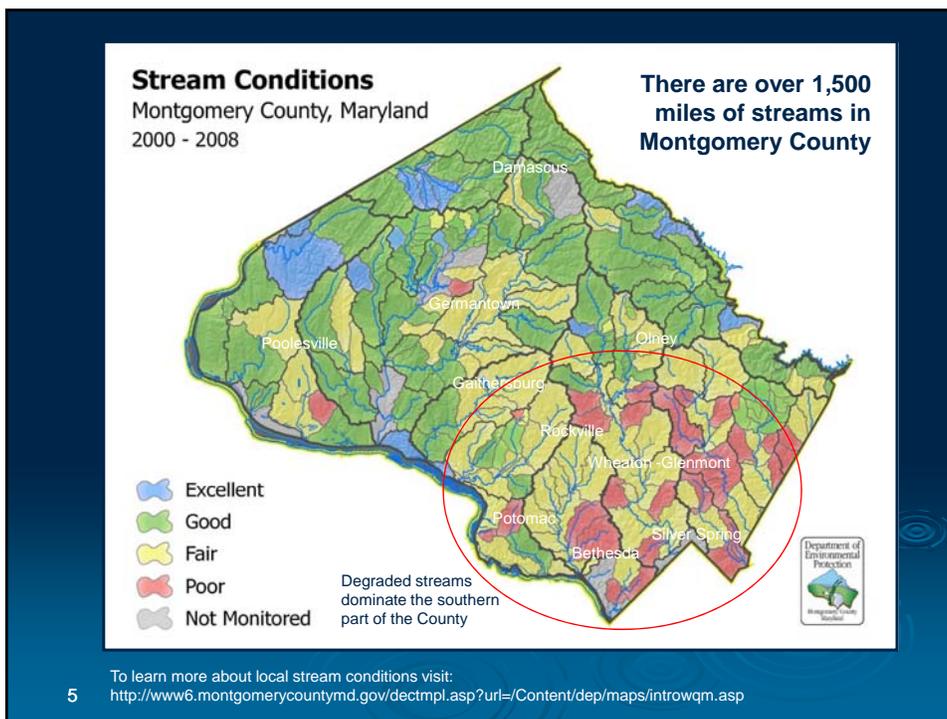
Let's Not Forget Our Hydrology 101 – The Water Cycle is a CLOSED System



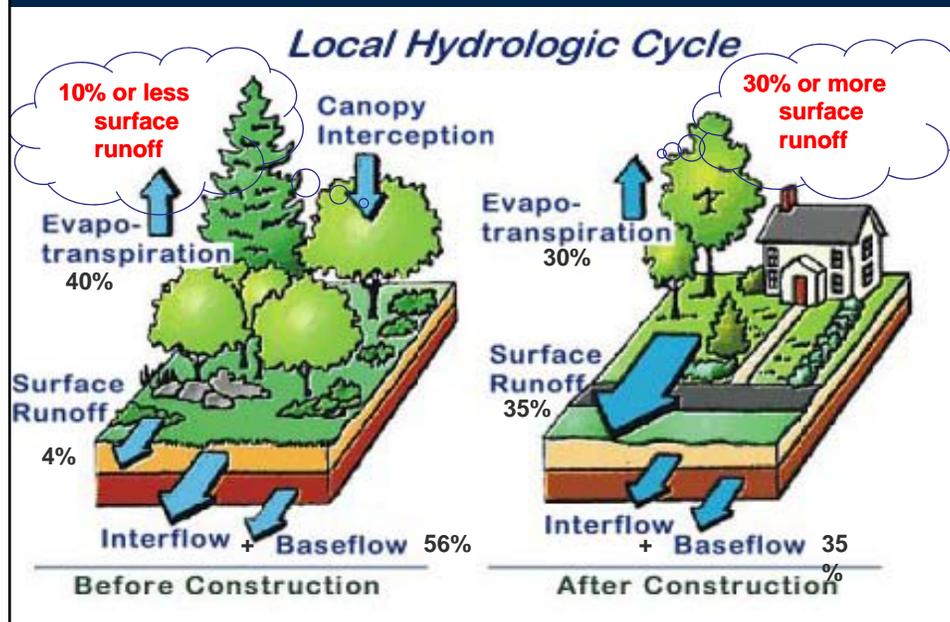
The water cycle is essentially a closed system, meaning that the volume of water that is in the hydrosphere today is the same amount of water that has always been present in the Earth system.



We'll come back to this later!



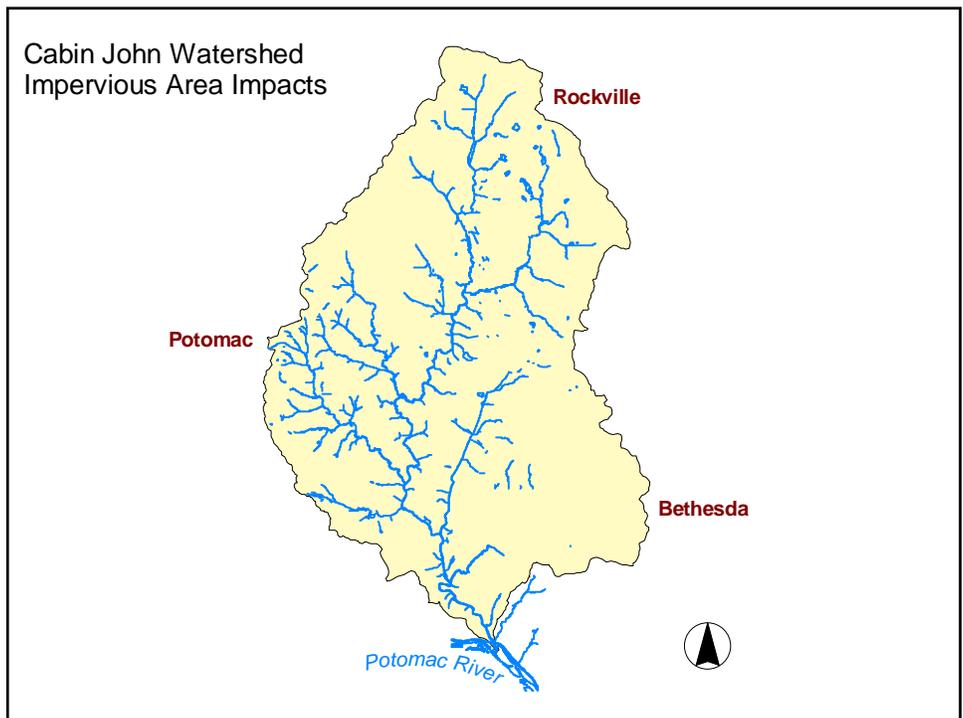
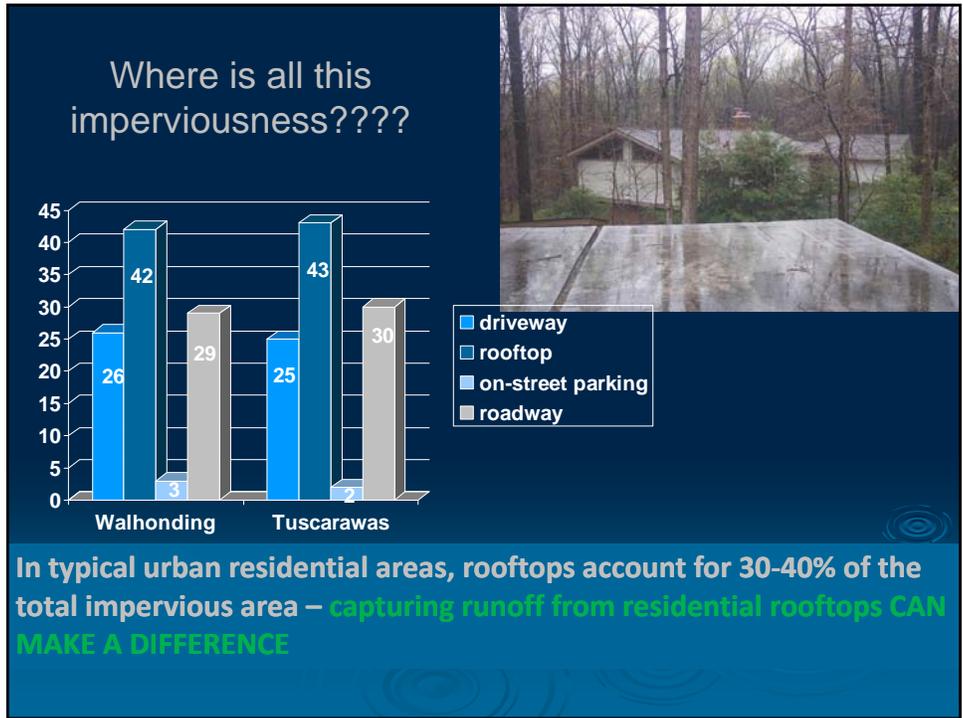
So HOW did our current stream conditions occur?

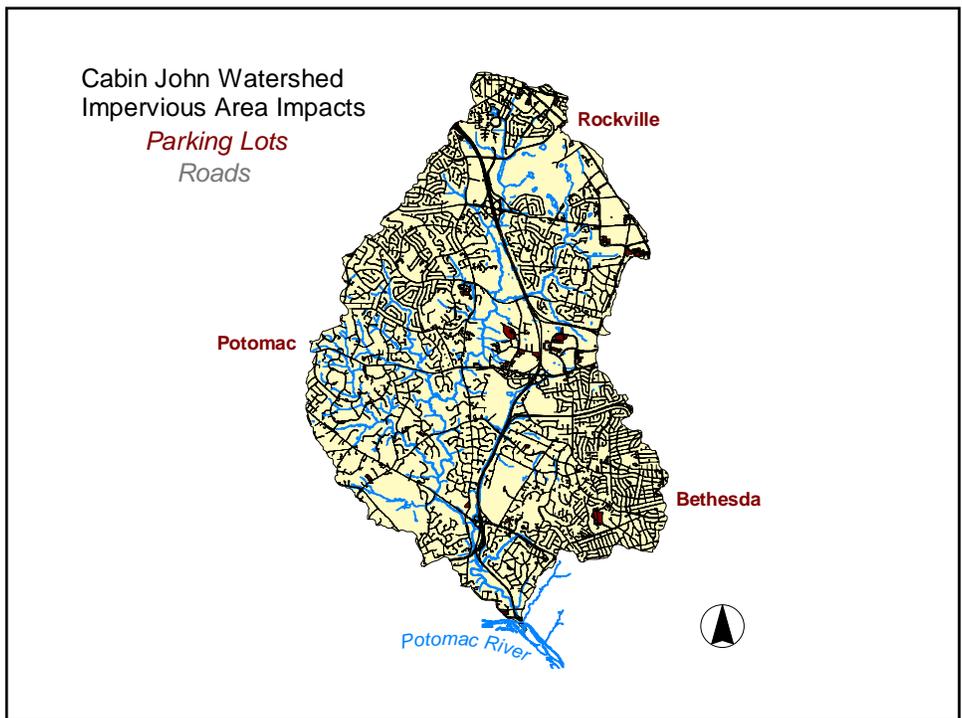
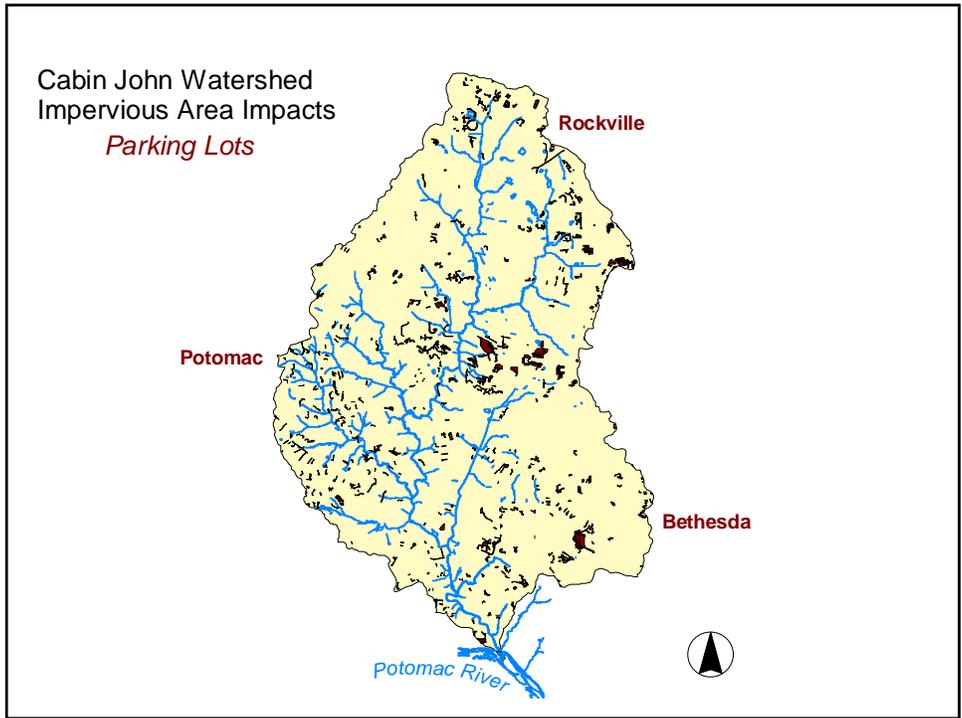


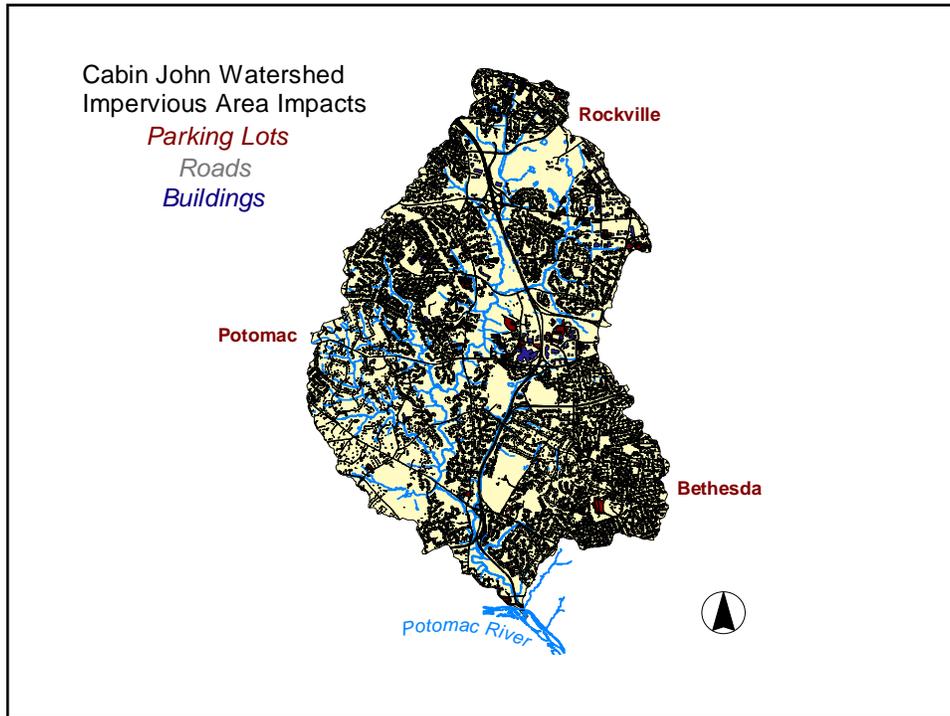
URBAN RUNOFF DIAGRAM

Landscape level response

- ☐ Increased % of land that is impervious (hard surfaces)
- ☐ Increased runoff and pollutants from the landscape
- ☐ Stormwater flows into surface channels and stormdrains, not the ground
- ☐ Reduced groundwater recharge (infiltration)
- ☐ Streams become “flashy” with lower baseflow and higher storm flows
- ☐ Eroding streambanks deposit sediment and degrade aquatic habitat
- ☐ And more...







What we see in our streams...



Sanitary Sewer Leaks / Threats to infrastructure

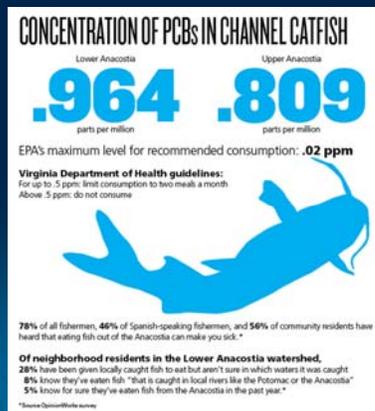


Sloughing of Vertical Banks – ongoing sediment loads



Stream temperatures rise. Streams become down-cut, with wide, shallow channels with very little habitat

And what we don't see...



What is the County doing to protect our Streams?

What opportunities are there for Landscape Professionals

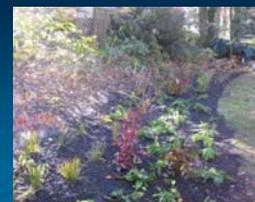
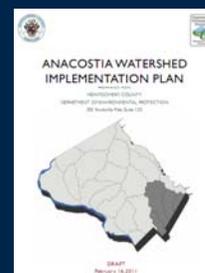
Regulatory Drivers

- Clean Water Act
 - MS4 permit
 - **MS4 = Municipal Separate Storm Sewer System**
 - 4,300 impervious acres in this permit cycle
- MD State Law – May 2010
 - **ESD to the MEP**
- County Stormwater Maintenance Regulations
 - **Required by our permit**
 - **Older facilities being brought up to standard, and new development**



Montgomery County, MD MS4 Permit Requirements

- Regulatory requirement to add stormwater management into areas which do not have existing stormwater control practices
- The new state stormwater manual Chapter 5 requires that **Low Impact Design (LID/ESD) practices be considered FIRST** for stormwater management
- **Why?**



Runoff Reduction = Infiltration

More traditional end of pipe treatments – they serve a purpose, but space is running out !

And...These practices are generally **not runoff reduction**



Low Impact Design (LID/ESD) = Infiltration

Watershed Management Division

- Stormwater Permit Coordination
- Stormwater Facility Maintenance
- Watershed Restoration and Capital Improvements Projects (CIP)
- RainScapes
- Monitoring



Stormwater Facility Maintenance

- Over 7,000 structures and growing
- Inspect all stormwater structures once every three years
- Perform maintenance on County Owned facilities through contractors
- Provide for stormwater facility transfer to the County's Maintenance program
 - Owners use contractors to bring facilities up to standard before transfer

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Stream Restoration



Before – sediment and poorly defined stream channel



After Completion

Turkey Branch

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Retrofits: Stormwater Wetlands



Before - Low flow channels



After



Rock Creek- Turkey Branch

Peppertree Pond Retrofit



CIP – Source control with an Integrated site retrofit

ESD/LID: Green Streets



Watershed Restoration *Source Control with RainScapes*

- “Beyond the CIP”
- Rewards Program and watersheds with ongoing restoration projects
- Focus on preventing pollutants from entering the storm drain system
- Provide outreach and stewardship opportunities



Retrofits: RainScapes



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Monitoring



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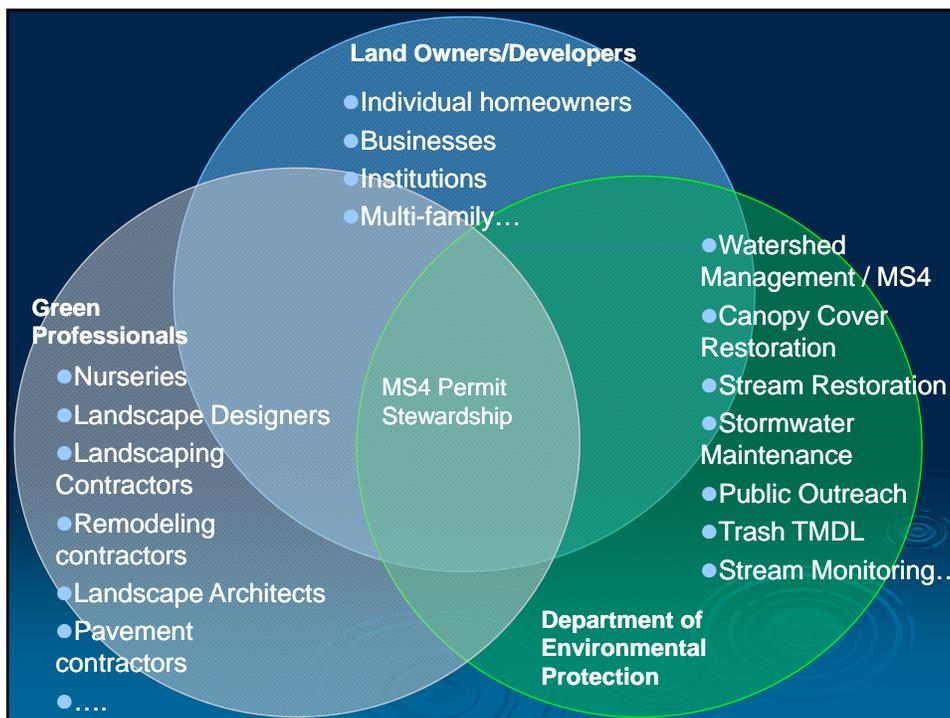
- Evaluates **biological resource/stream habitat conditions**
- Rate streams as excellent, good, fair, poor
- Help set **priority watersheds for Capital Improvement Program to address stream degradation**
- **Project effectiveness in Special Protection Areas**

Outreach

- Public Outreach
- Watershed Group Capacity Building
- Stream Stewards Volunteer Program



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It's Not Easy Being Green

Green today means so many different things to different people.

Marketing and PR departments have responded to the changing marketplace by giving everything from consumer products to automobiles a green makeover.

But at the end of the day, sustainability hasn't become a true business strategy for many organizations.

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The Future of Green Business Strategy

The Four Trends :

Montgomery County's
Green Business
Certification!

1 | Certifiably Green

Green standards and certifications will change the competitive landscape of industries and the players within them.



2 | The Greenest Link

It's not just about what you make anymore—but about how (and where) you make it.



3 | The Green Seeds of Innovation

The desire to go Green forces companies to reinvent products, services, and business models in ways we've never seen before.



4 | Green Goes Niche

The story behind Green goes from mass to niche with highly targeted messages.



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