Stormwater What? ....Uh - oh

A single tin of paint can pollute millions of litres of water.

WWF

Historical – How We Got Here

– 1982 - Stormwater Management Act passed by Maryland General Assembly.

– 1983 - Stormwater Management Regulations *(COMAR 26.17.02)* adopted.

– 1984 - Local ordinances implemented/*Chesapeake Bay Critical Area* Commission Established

– 1986 - Water quality management generally applied across Maryland ("first flush" rule; generally equal to ½ inch of runoff over impervious area)

– 1990 - *Federal Clean Water Act*

– 1993 - Goals for modifying the stormwater program established: Specific guidance for water quality; Manage more frequent storm events; Limit number of stormwater management waivers; *Provide incentives for environmentally friendly design*

Historical - How We Got Here

- 1996 - Section 309 & 306 Coastal Zone Management (CZM) Grants awarded for development of new ***Stormwater Design Manual.***

- 1997 - First draft of the new Stormwater Design Manual is published (subsequent drafts published in Sept. 1998 and Dec. 1999).

- 2000 - Amended regulations and the Design Manual are adopted.

- 2001 - Revised program implemented locally/.

- 2007 - Stormwater Management Act – ***ESD***

- ***2010 - Local Requirements/Local Influence: You Are Here!***
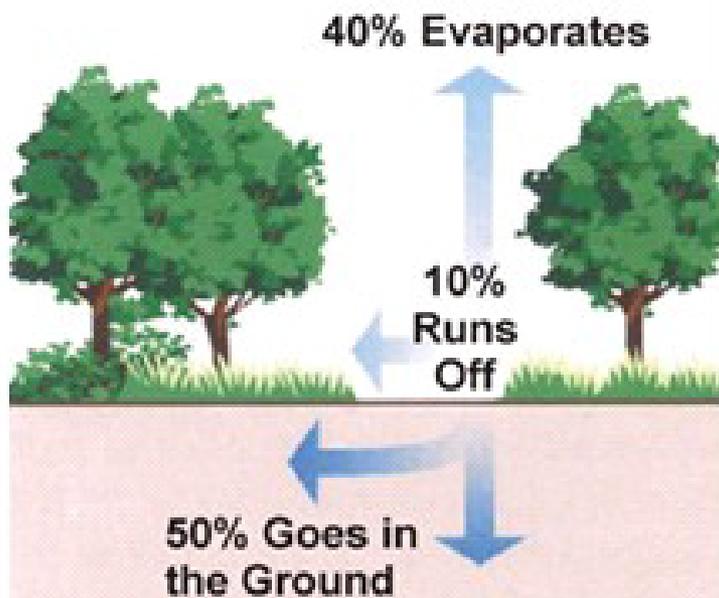
Oh so lovely – And this is Good Compared to…
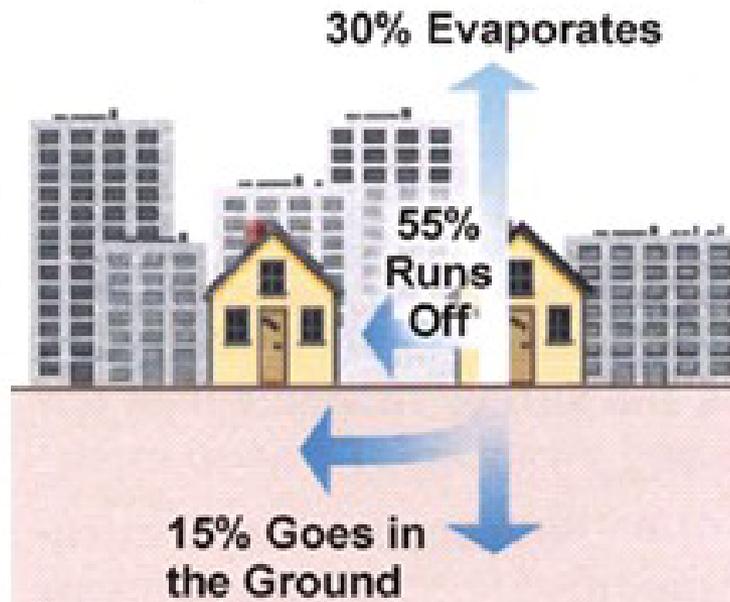
Who's Job is Stormwater Maintenance?

Duh....

The water cycle in a natural area | The water cycle in a suburban or urban area

40% Evaporates
10% Runs Off
50% Goes in the Ground
The Federal Interagency Stream Restoration Working Group

30% Evaporates
55% Runs Off
15% Goes in the Ground
The Federal Interagency Stream Restoration Working Group

The Laymen's Version of the Goal

from Stormwater Management to RAINwater Management

From TRADITIONAL to	INTEGRATED:
Drainage Systems	Ecosystems
Reactive (Solve Problems)	Proactive (Prevent Problems)
Engineer-Driven	Interdisciplinary Team-Driven
Protect Property	Protect Property *and* Habitat
Pipe and Convey	Mimic Natural Processes
Limited Consultation	Extensive Consultation
Local Government Ownership	Partnerships with Others
Extreme Storm Focus	Rainwater Integrated with Land Use
Peak Flow Thinking!	**Volume-Based Thinking!**

Best Management Practices

- Strategies to implement a combination of structural and non-structural BMPs,
- An ordinance to address stormwater management,
- A program to ensure adequate long-term operation and maintenance of BMPs.

Sustainable Thinking Buzzwords

- Innovative BMPs for Site Plans
  - Alternative Turnarounds
  - Conservation Easements
  - Development Districts
  - Eliminating Curbs and Gutters
  - Green Parking
  - Green Roofs
  - Infrastructure Planning
  - Narrower Residential Streets
  - Open Space Design
  - Protection of Natural Features
  - Redevelopment
  - Riparian/Forested Buffer
  - Street Design and Patterns
  - Urban Forestry
- Infiltration
  - Grassed Swales
  - Infiltration Basin
  - Infiltration Trench

- Permeable Interlocking Concrete Pavement
- Pervious Concrete Pavement
- Porous Asphalt Pavement
- Filtration
  - Bioretention
  - (Rain Gardens)
  - Catch Basin Inserts
  - Sand and Organic Filters
  - Vegetated Filter Strip
  - Retention/Detention
  - Dry Detention Ponds
  - In-Line Storage
  - On-Lot Treatment
  - Stormwater Wetland
  - Wet Ponds
- Other
  - Alum Injection
  - Manufactured Products for Stormwater Inlets

More Information

- http://www.mde.state.md.us/Pages/Home.aspx

- http://www.cbf.org/Document.Doc?id=151

- http://www.mde.state.md.us/assets/document/Stormwater%20Act%202007%20Update.pdf

- http://mlis.state.md.us/2007RS/chapters noln/Ch 122 hb0786T.pdf

- http://www.mde.maryland.gov/programs/Water/StormwaterManagementProgram/PublicationsList/Pages/Programs/WaterPrograms/SedimentandStormwater/publicationsList/index.aspx

- Three guidance documents:
  - Maryland Model Stormwater Management Ordinance July 2009 & April 2010
  - Environmental Site Design Process & Computations July 2010
  - Environmental Site Design Redevelopment Examples October 2010