

Stormwater Basin Maintenance



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Cuyahoga SWCD

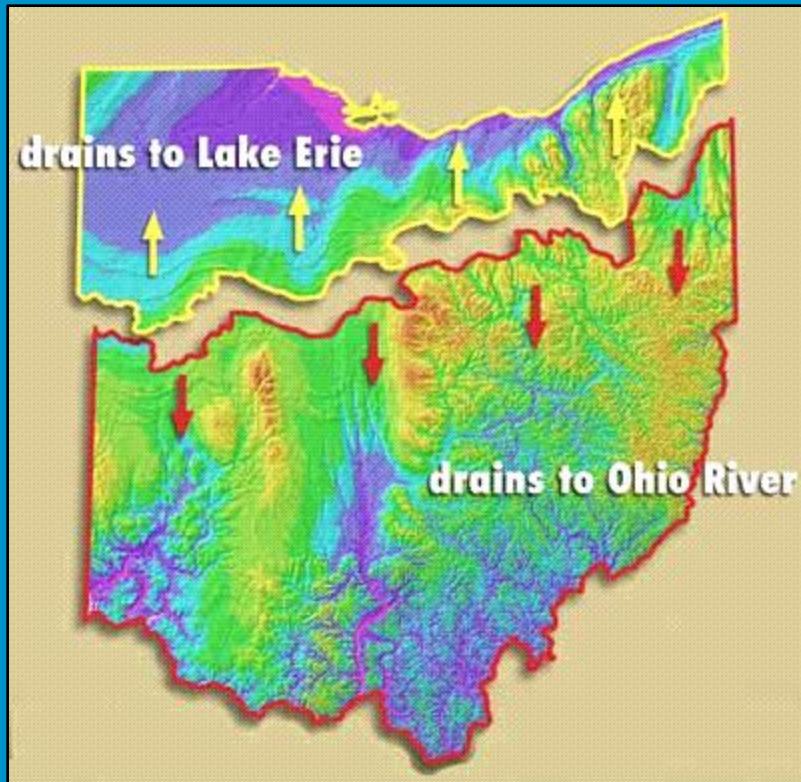


Presentation Overview

- Stormwater Overview
- Stormwater Basins
- Stormwater Basin Maintenance
 - Common
 - Non-Routine
- Good Basin Stewardship Habits
 - Lower Non-Routine Costs
- Questions



Stormwater Overview: What is a watershed?



Where does it go?

Our rooftops, lawns and driveways are directly connected to local creeks and streams, and ultimately to Lake Erie.

They form the headwaters of our urban stream systems, and it is our responsibility to give our local streams a clean, healthy start.



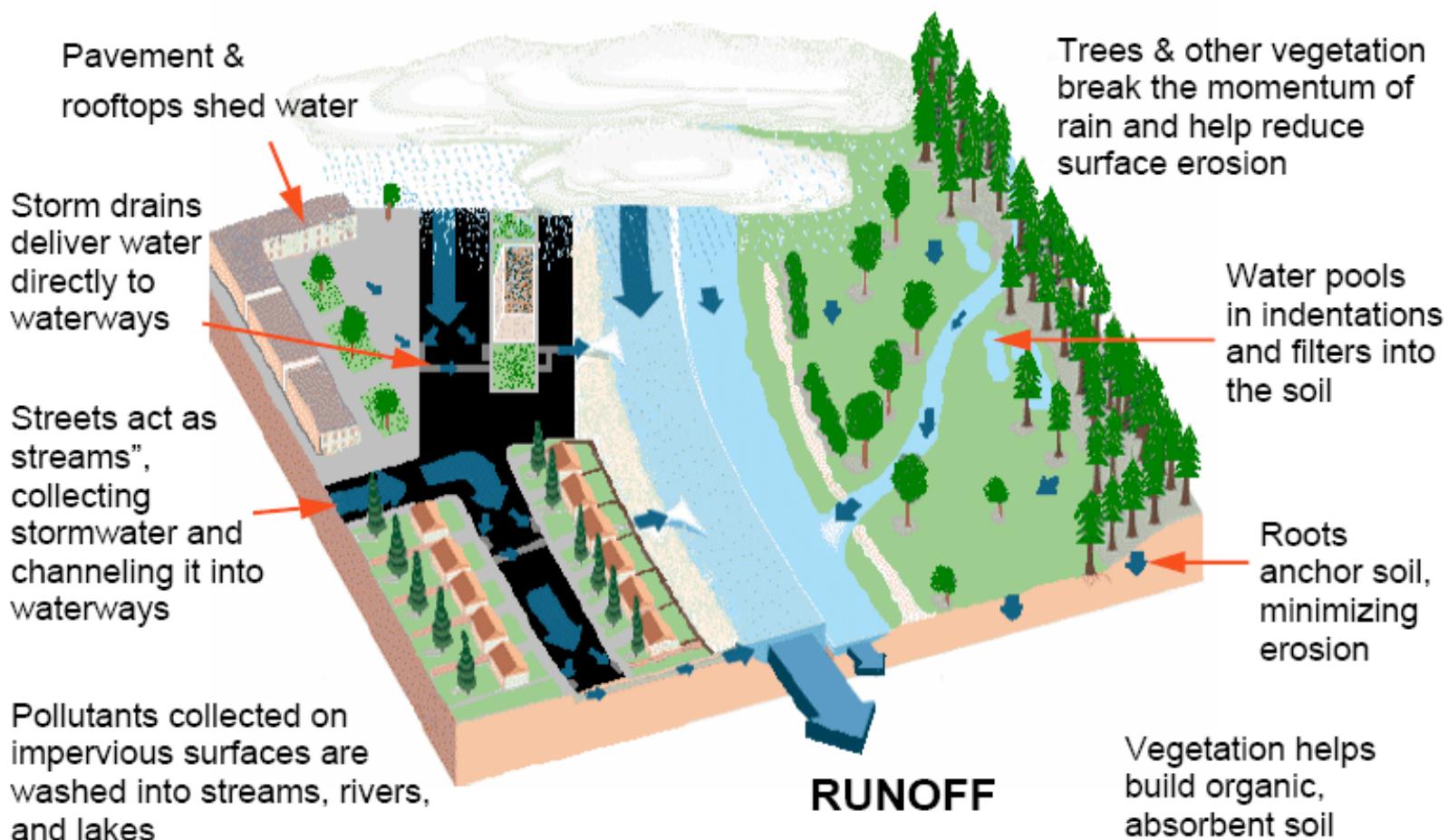
Stormwater

DEVELOPED LANDS

Rain pours more quickly off of city and suburban landscapes, which have high levels of impervious cover

NATURAL LANDS

Trees, brush, and soil help soak up rain and slow runoff in undeveloped landscapes



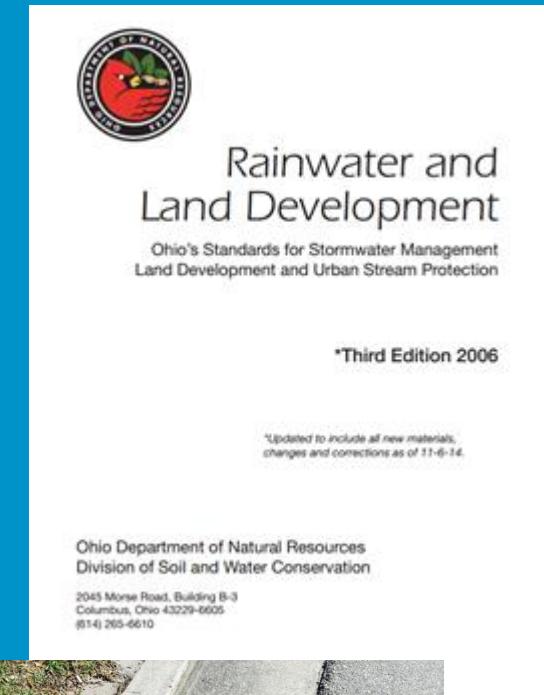


A satellite image of Lake Erie and surrounding land areas. The lake is filled with a massive, swirling algal bloom, appearing in various shades of green, teal, and brown. The surrounding land is a mix of agricultural fields, urban areas, and forested regions. The text 'Lake Erie Algal Bloom – October 2011' is overlaid in the center of the image.

Lake Erie Algal Bloom – October 2011

Stormwater Rules

- Municipal Separate Storm Sewer System (MS4)
- Federal Clean Water Act
 - Regulates MS4s in urbanized areas
 - NPDES permit required to discharge from MS4
- Communities (MS4s) in urbanized areas
 - develop and enforce ordinances or resolutions
 - ensure Stormwater Control Measure (SCM) function
 - maintain publicly-owned SCMs
- Landowners
 - maintain privately-owned SCMs



Stormwater Basins

Purpose & Design

- Control runoff and flooding
- Water quality improvements
- Landscape and aesthetic value
- Designed by licensed engineers specialized for site conditions
 - Watershed size
 - Available space
 - Target pollutant removal
 - Soil types



Needed for Proper Basin Function

- Maintenance Plan
- Annual Budget
- Regular inspection
- Specialized landscaping
 - Mowing height
- Specialized plant management
 - Think clean water
 - Avoid fertilizers and pesticides
- Water Level Management
- Stabilization Maintenance
- Protection from **sediment**
- Regular trash cleaning

Facility:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Location:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Date:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Inspector:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Rain in L:	<input type="checkbox"/> Yes <input type="checkbox"/> No
Pretreatment:	<input type="checkbox"/> Yes <input type="checkbox"/> No

Routine Maintenance

- Outlet pipe a
- Dam/i establ
- Erosio dry po
- Veget
- Sedim pond t



dry and ponding dry pond. ining area, side pipe inlets, pipe s appear during dry pond.

<input type="checkbox"/> Yes <input type="checkbox"/> No

Elements of Basin Maintenance

- Not the same as Landscape Maintenance
- Trained staff that recognize early signs of problems
 - Erosion, clogged outlets, invasive plants, etc.
- Good Housekeeping – Prevention of problems
 - Inspect regularly
 - Use a maintenance checklist
 - Focus on preventative maintenance to avoid costly corrective repairs



Why Maintain?



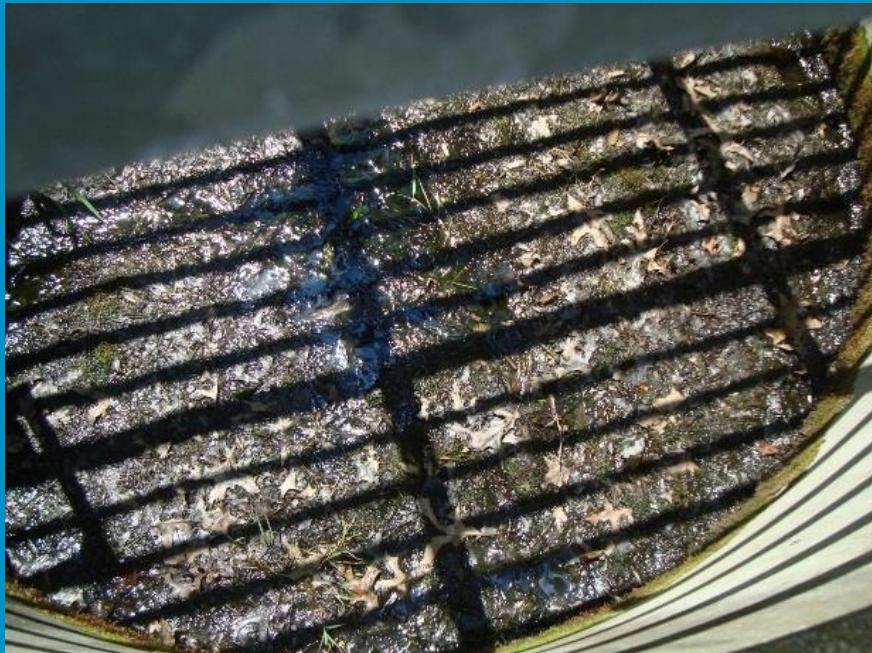
Before



After

Common Maintenance Issues

Sediment Accumulation, Trash & Clogging



- **Monthly & After Large Rain Events**
- **Outlet & Inflow Structures**



Common Maintenance Issues

Vegetation Management

Small shrubs for edges:

Myrica gale (sweetgale)

Lindera benzoin (northern spicebush)

Ledum groenlandicum (bog Labrador tea) evergreen, requires acidic soil (pH <6.8)

Kalmia polifolia (bog laurel) evergreen, requires acidic soil (pH <6.8)

Hibiscus moscheutos (crimson-eyed rosemallow)



Vallisneria americana



Sagittaria latifolia



Pontederia cordata



Nymphaea odorata



Justicia americana



Hydrocotyle umbellata



Menyanthes trifoliata



Lobelia siphilitica



Equisetum hyemale



Carex stipata



Myrica gale



Hibiscus moscheutos



Common Maintenance Issues

Stabilization & Erosion



- **Repair soil erosion and scouring as it occurs**
- **Starts at inflow areas**
- **Refresh Vegetation/Turf**
- **Prevent Woody Vegetation growth on dams/banks**



Common Maintenance Issues

Ponding Water Beyond Design Criteria



- **Clogged Outlets**
- **Clogged Drains**



Common Maintenance Issues

Pests



- Insect infestations
- Burrowing Animals
- Excessive Geese
- Algal Blooms



Common Maintenance Issues

Pests

- Rodent Burrows
 - Fill animal burrows with clay
 - Hire trapper if needed
- Geese
 - Leave a vegetative buffer – less tasty grasses (tall fescue)
 - Hire a dog
 - Decoys/Sound
 - Don't feed
- Algae
 - Fertilize less
 - Don't fertilize near the basins
 - Aerate



Common Maintenance Issues

Pollution



- **Foul odors**
- **Oil Sheens**
- **Discoloration of water**



Non-Routine Maintenance Issues

Invasive Species



Phragmites



Cattail

- **Constant maintenance required \$\$\$**
 - Remove invasive mat-forming vegetation
 - Remove algae (can be composted!)
- **Consider subletting aquatic weed control**
 - Mechanical and chemical options
 - License required for herbicide application



Non-Routine Maintenance Issues

Sediment Removal

- Once 25% pool volume lost
 - Loss of storage issues
- Eutrophication
- Plans
 - What is design depth?
- Survey
- Dredge
- 15-20 years
- \$\$\$



SCM Stewardship: Good Habits

- No neglect
- No dumping
- Keep the watershed clean
- No pet waste
- Vegetate bare soils
- Don't over fertilize
- Protect from salt
- Plan for snow storage
- Plant native vegetation



= \$\$\$ Savings Long-Term



Aeration

- Provide Oxygen
- Bacteria Break Down Muck
- Less to Dredge Over Time



Take Home Messages

- ✓ Create an Annual Budget for Basin Maintenance
- ✓ Create a Maintenance Plan and provide contractors with inspection checklists
- ✓ Hire educated management and contracting teams
- ✓ Keeping your property “clean” = lower long-term basin maintenance costs
- ✓ Utilize Cuyahoga SWCD and Local Resources

Now Available

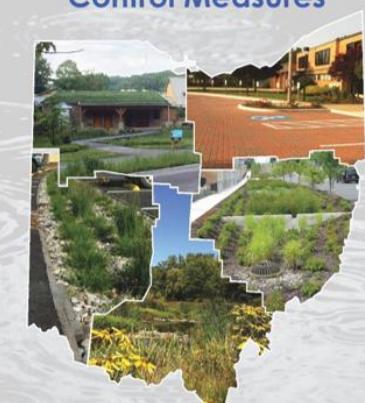
Maintaining Stormwater Control Measures

Guidance for Private Owners & Operators

Download the Manual
www.neohioshormwater.com

Or contact your local Soil and Water Conservation District office or Community Stormwater Manager for more information.

Maintaining Stormwater Control Measures



Guidance for Private Owners & Operators

Resources

- Cuyahoga SWCD: <http://www.cuyahogaswcd.org/>
- Maintaining Stormwater Control Measures:
<http://www.cuyahogaswcd.org/files/assets/scmownermanual-draft.pdf>
- Geese: <https://ohioline.osu.edu/factsheet/W-3>
- Native Plants: Landscaping for Biodiversity with Ohio Native Plants: A Species Guide for Plantings. – Cleveland Metroparks
- Invasive Plants:
<https://www.invasivespeciesinfo.gov/resources-indexed>





Questions?

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