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# Milwaukee's Green View

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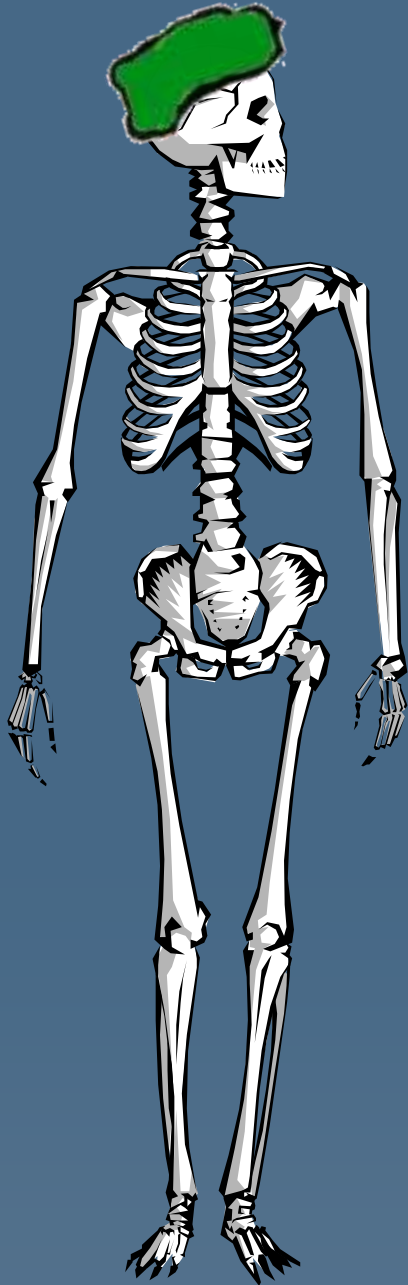
*milwaukee metropolitan sewerage district*

# Everything is coming up Green in Milwaukee



Of course, we know why!





*But you have to start  
with a grey backbone...*

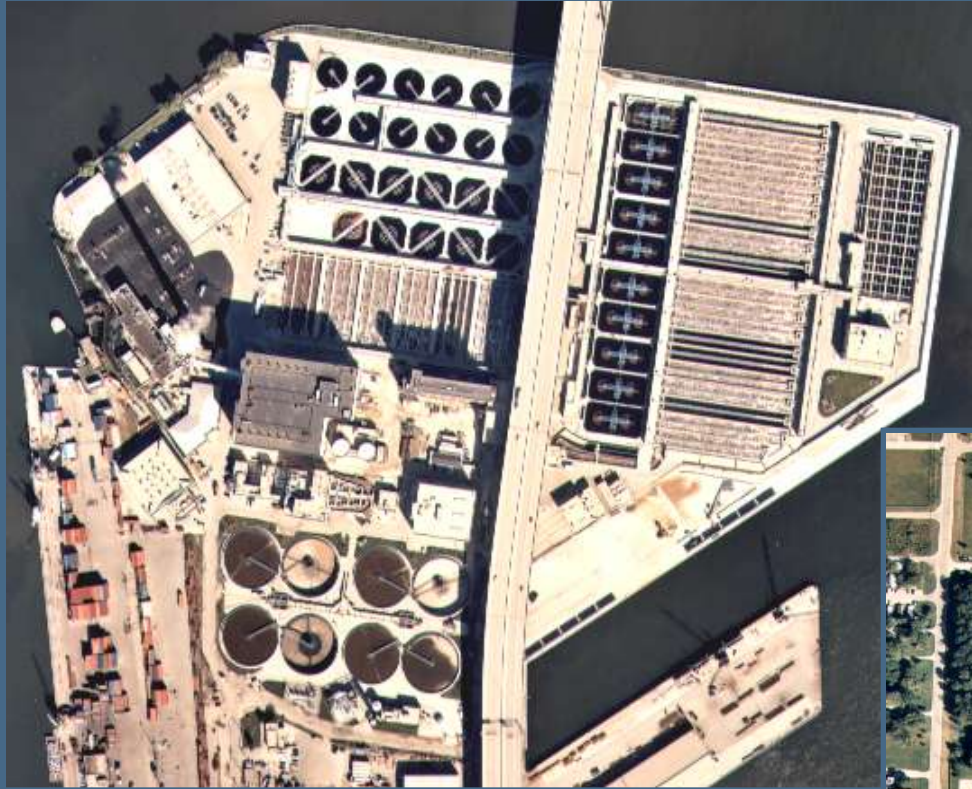
- Treatment Plants
- Sewers
- Storage Vessels...

*To go Green...*

- Rain Barrels
- Rain Gardens
- Bioretention...



# *Jones Island*



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# Wastewater Treatment Facilities

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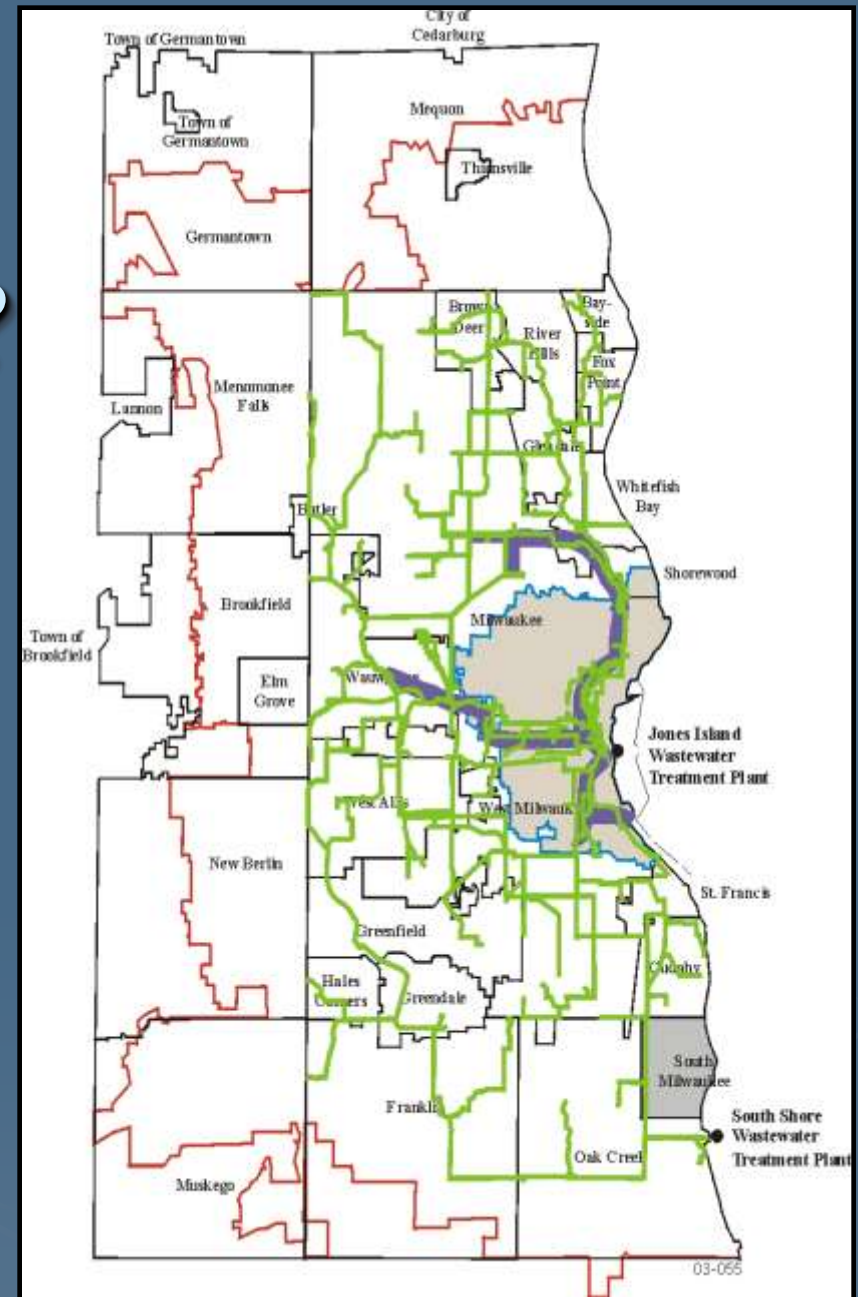


# *South Shore*

# How does the water get to the Treatment Plants?

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- 300 miles / MMSD sewers
- 3,000 miles / Community sewers
- 3,000 miles / Private property sewers





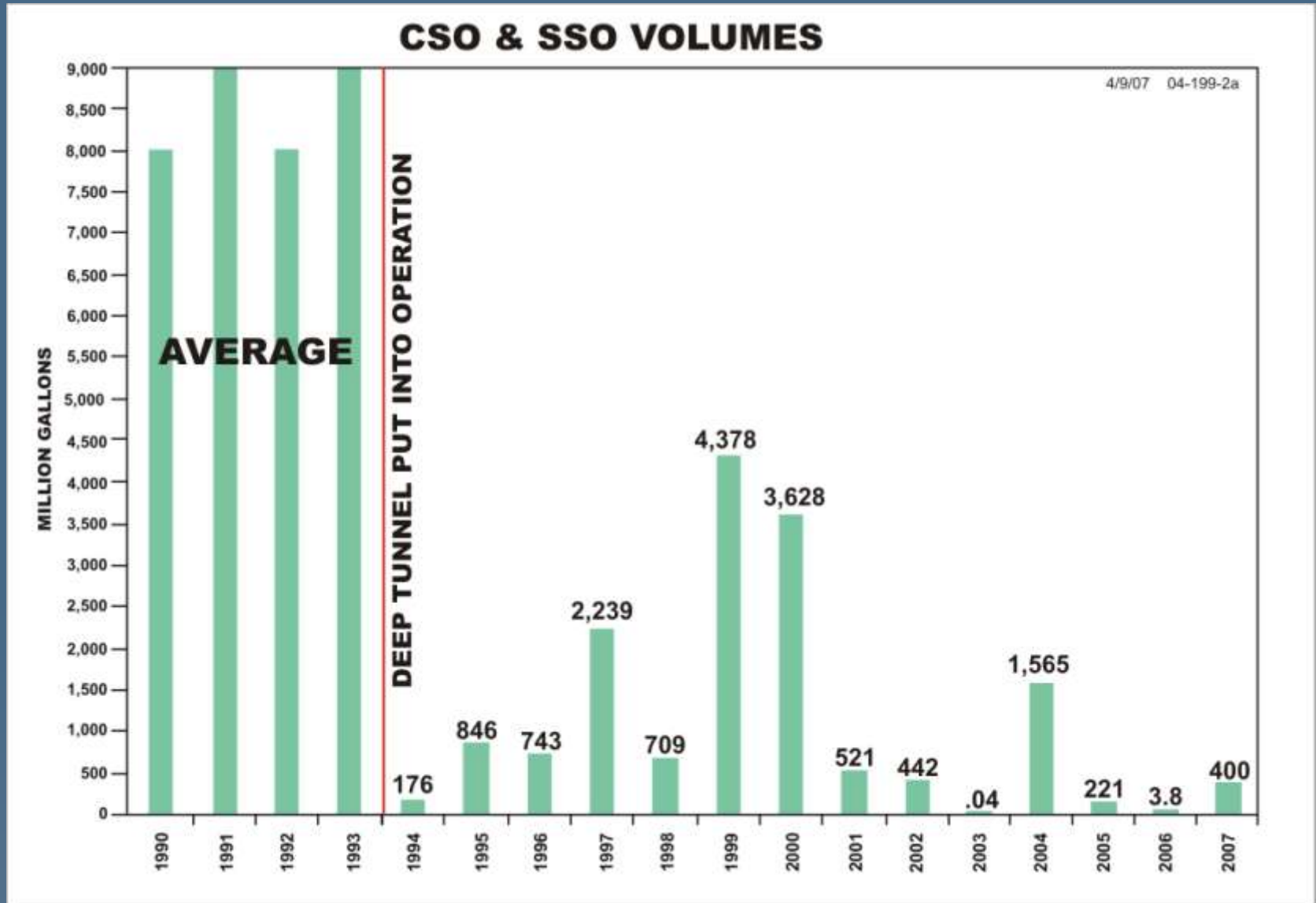
# Deep Tunnel System in ~~1994~~ <sup>2006</sup>



- 300 feet below ground
- ~~405~~ <sup>494</sup> million gallons
- ~~19.4~~ <sup>26.5</sup> miles long
- 17- to 32-foot diameter
- Designed to minimize basement backups and for 1-2 overflows a year



# Results of our Grey Backbone

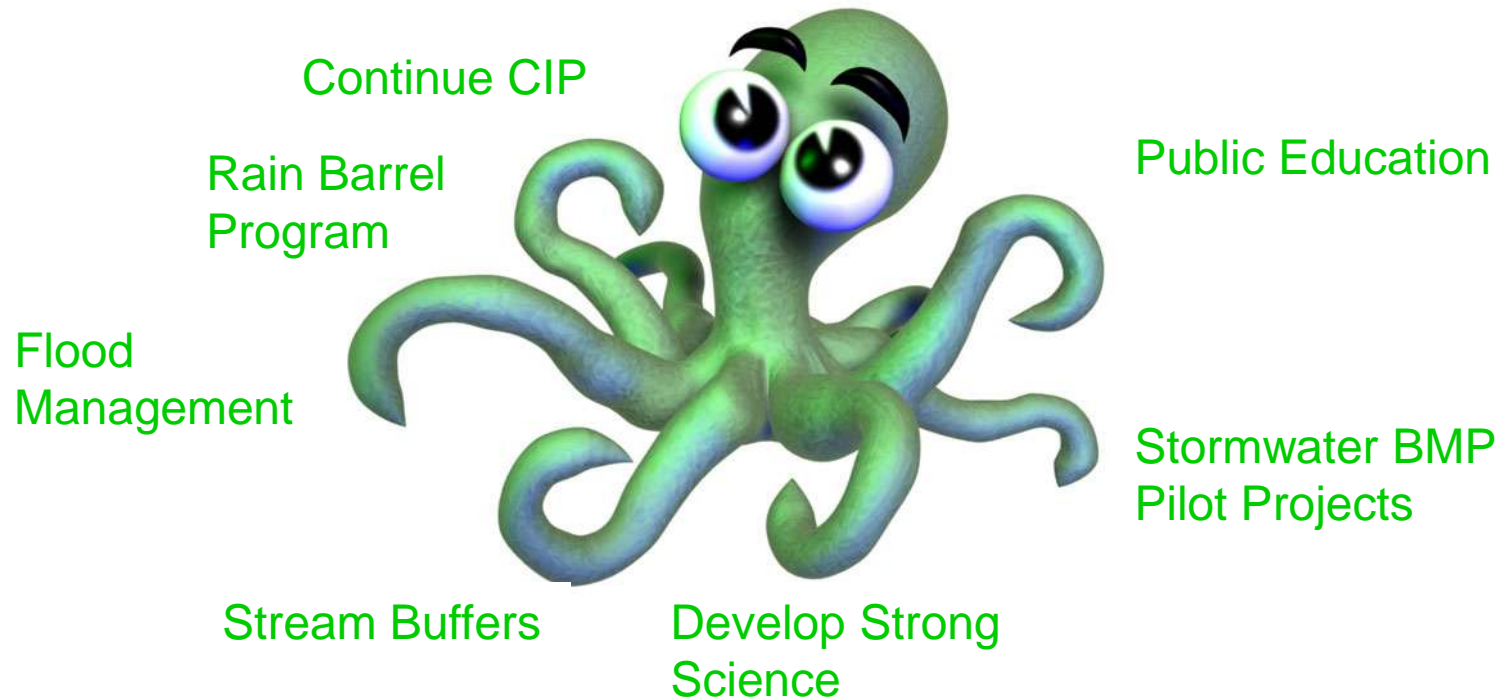




Beaches will still close  
even with  
**ZERO** overflows.



# We Addressed this in Many Ways



Before



# Lincoln Creek

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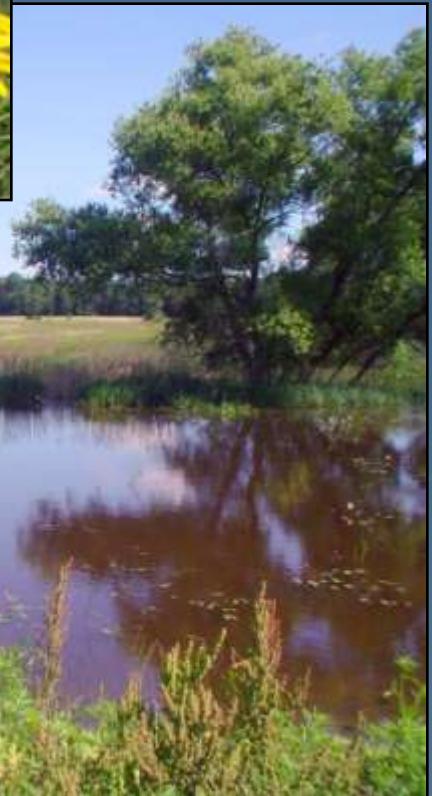
After



- Concrete Removal
- Minimized Floodplain
- Habitat Enhancement



# Green Seams



- 454 acres in 2006
- Over 1,300 acres since 2001
- \$8.9 million since 2001
- \$891,000 grants since 2001



# Stormwater Ordinances

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- In 2002, MMSD implemented a “Stormwater rule”
  - Requiring 28 communities to implement a stormwater runoff ordinance for all new impervious areas greater than  $\frac{1}{2}$  acre.
    - 100-year runoff release rate - 0.5 cfs/acre of new impervious area
    - 2-year runoff release rate - 0.15 cfs/acre of new impervious area

# Every DROP COUNTS

WE

STARTED  
BECAUSE  
IT MADE  
SENSE...

• Rain Gardens



• Stormwater  
Trees



• Rain  
Barrels



• Downspout  
Disconnection



• Green  
Roofs



# Rain Barrels

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6,150  
Since 2003





# Green Roof

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## MMSD Headquarters

- Installed Summer 2003
- 435 containers in “green grid” container system
- Covers 4,000 square feet





# Stormwater BMPs

- MMSD has sponsored 23 projects since 2003





# Rain Gardens

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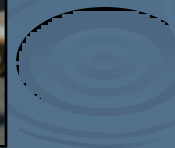
- Shorewood – 50 rain gardens
- Urban Ecology Center
- Auto Recyclers







11,246  
Plants sold since 2005



# Stormwater Management Education



Milwaukee River Flushing Station

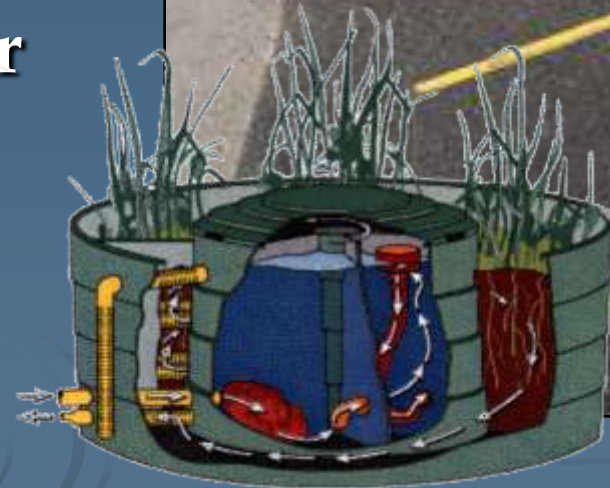
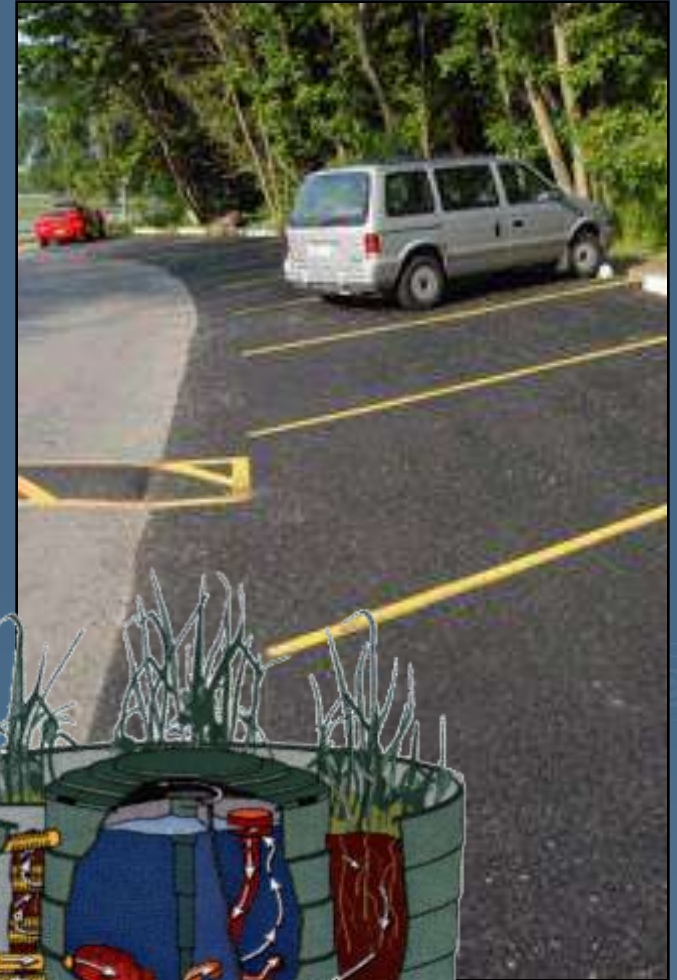


# Getting it done in the Region: Whole Demonstration Sites

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## Alterra Coffee Shop

- Porous pavement
- Downspout Disconnection
- Rain Barrels
- Rain Garden
- Water Quality Inlet Filter
- Estimate 30%  
reduction in runoff





# Hart Park Flood Management

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# Stormwater Reduction BMP

## Volume Reduction

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- 1. Downspout Disconnection (dd) 12%
- 2. Rain Barrel (w/ dd) 14%
- 3. Rain Garden (w/ dd) 36%
- 4. Rain barrel and Rain Garden (w/ dd) 38%
- 5. Green Roof 22%
- 6. Bioretention 70%
- 7. Green Parking Lot 76%
- 8. Stormwater Trees 10%

# Pollutant Removal Estimates for Stormwater BMPs

Pollutant	Infiltration Practices	Bioretention	Porous Pavement	Constructed Wetland
Total phosphorus	70	34	85	49
Soluble phosphorous	85	38	--	35
Total nitrogen	51	84	--	30
Nitrate	82	31	30	67
Copper	--	51	--	40
Zinc	99	71	--	44
TSS	95	81	85	76

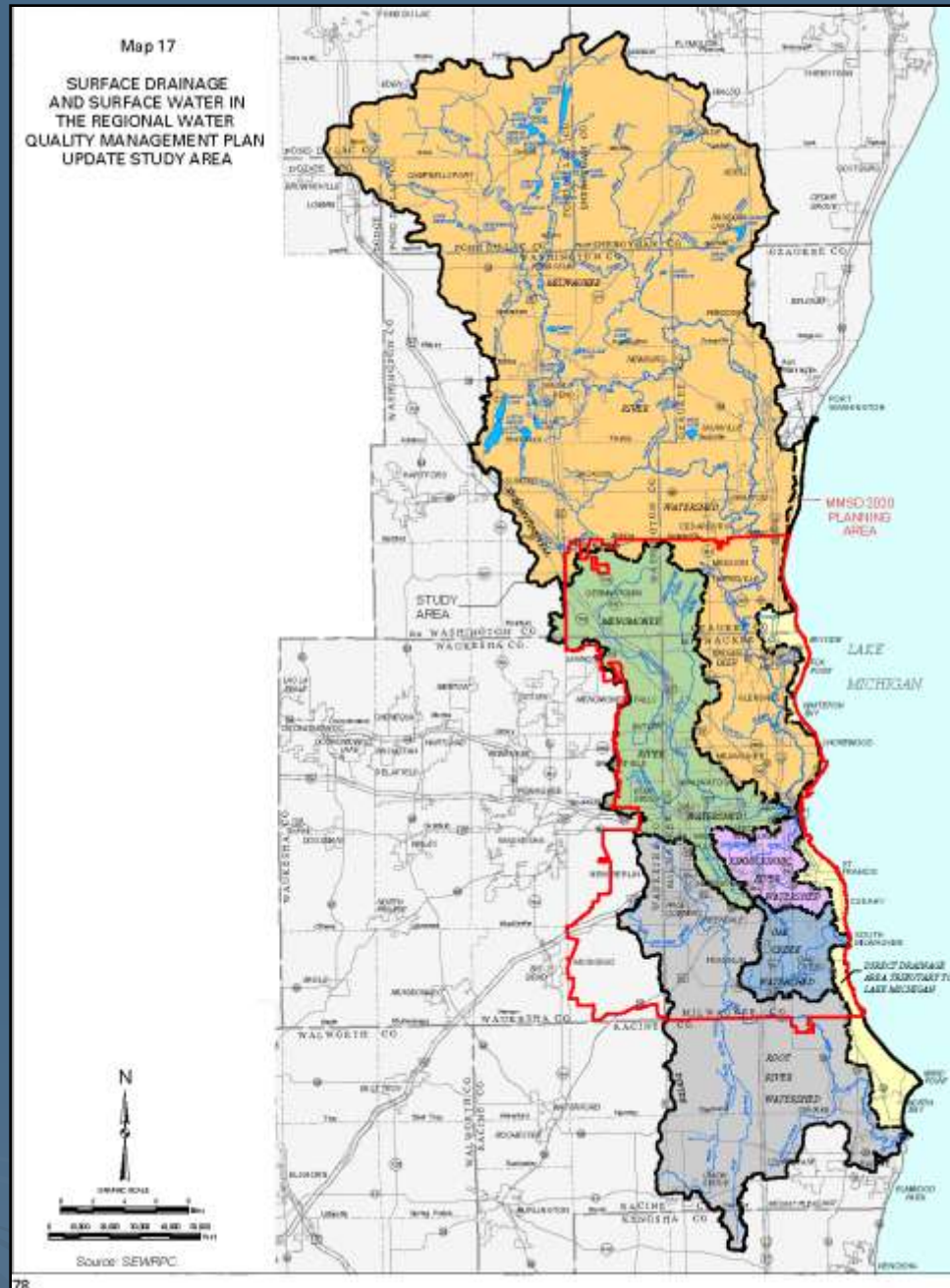
Sources: National Pollutant Removal Performance Database for Stormwater Treatment Practices, Center for Watershed Protection, June 2000  
Pennsylvania Stormwater Manual (draft, 2004)

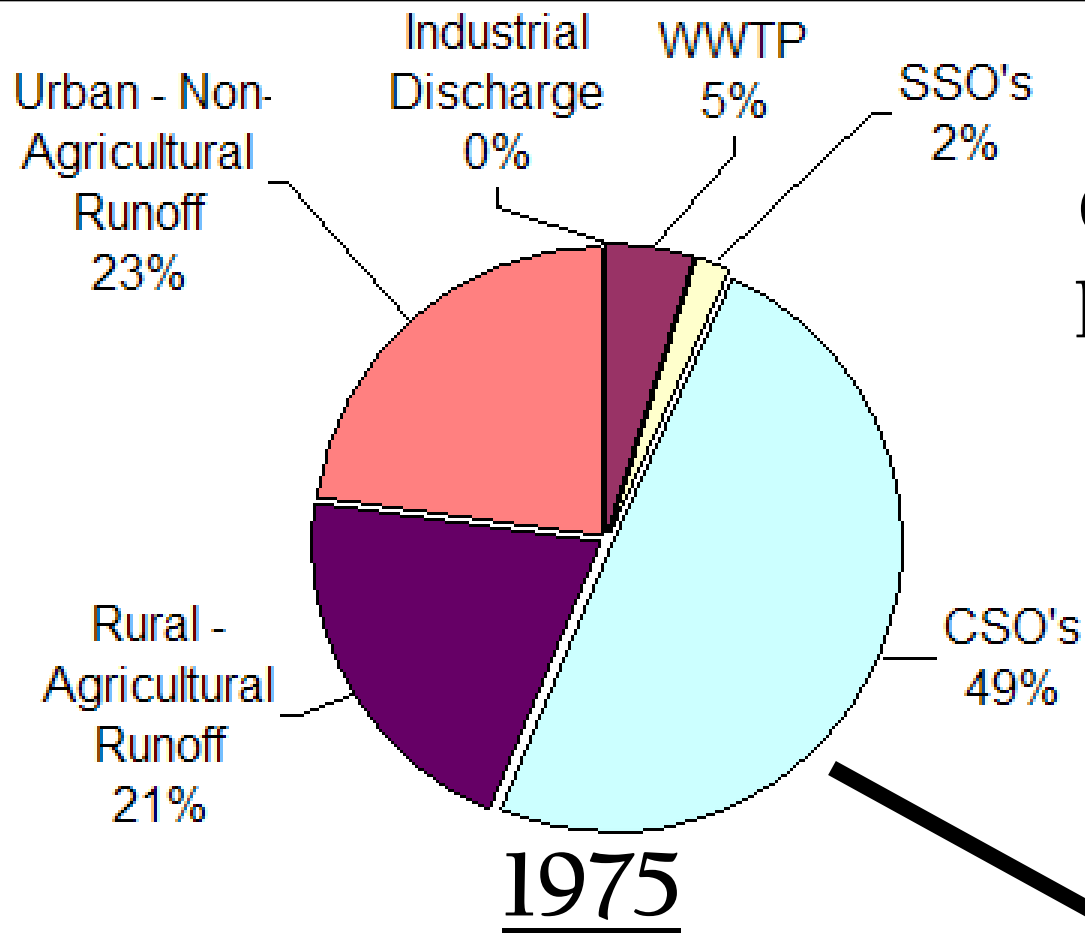


# The Water Quality Initiative

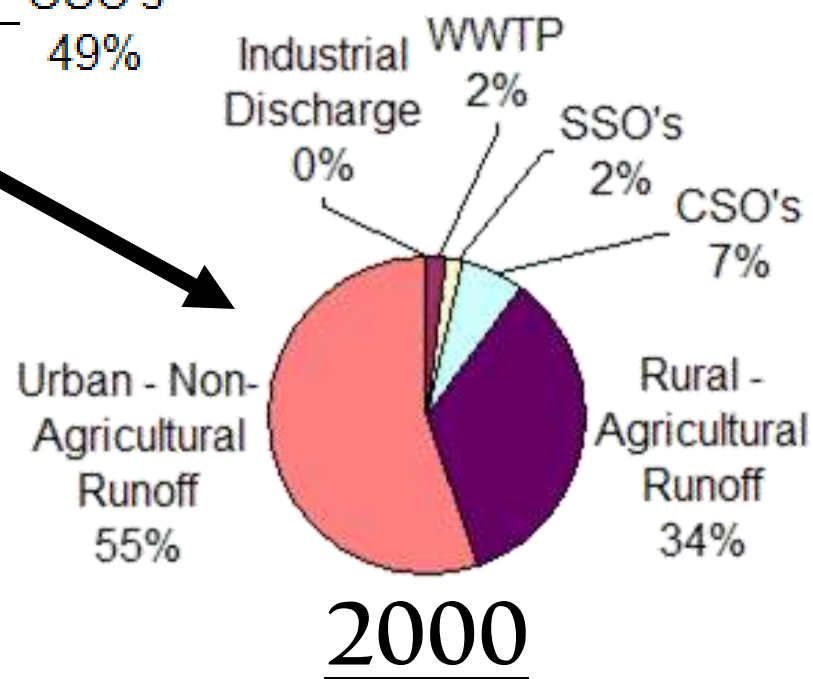
## A Watershed Approach

<u>Watershed</u>	<u>Area (square miles)</u>
Kinnickinnic River	24.7
Menomonee River	135.8
Milwaukee River	700.0
Oak Creek	28.2
Root River	197.6
Lake Michigan Direct	40.7
<b>Drainage Area</b>	
<b>Total</b>	<b>1,127.0</b>
<b>Number of Counties</b>	<b>9</b>
<b>Number of Local Municipalities</b>	<b>83</b>





# Greater Milwaukee Region's Combined Fecal Coliform Loadings



***So, why go Green?***

# So what does **Green** Mean in Milwaukee?

- Integrated water management (Grey and Green)
- Goal is reduced CSO volume
- Multiple benefits
  - Less runoff
  - Reduced energy costs
  - Usually more affordable
  - Improved air quality
  - Improved quality of life
- Broad appeal
  - Public acceptance
  - Elected official acceptance
- Turns the polluter “label” to the protector “label”



➤ **WE ARE THE PROTECTORS OF THE ENVIRONMENT!!!**





# MMMSO

Preserving The Environment •  
Improving Water Quality

