

Reaping The Benefits of MS4 Compliance

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CWC

Goals of NJDEP 2023 MS4 Update

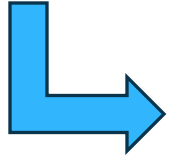
- Improve function, performance and maintenance of municipal stormwater infrastructure.
- Reduce MS4 contribution of pollutants to impaired waterbodies & TMDL waterbodies.
- Address stormwater flooding to protect human health and safety and decrease environmental impairments.



Watershed Improvement Plan (WIP)
blueprint to achieving all of the above.

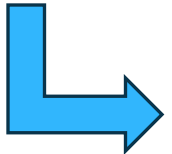
WIP – 3 Step Process

- Step 1 – Watershed Inventory Report –



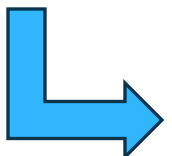
Compilation of information about SW collection system

- Step 2 – Watershed Assessment Report



Identifies MS4 projects, cost, sources of funding, schedule of implementation

- Step 3 – Watershed Improvement Plan –



Implement SW mgmt. projects resulting in correction, protection and restoration... operational blueprint

The Four “Rs” of WIP

- **Reduce** flooding and NPS pollution
- **Retrofit** Use green infrastructure practices to increase performance of existing SW infrastructure
- **Repair** impaired ecosystems
- **Restore** ecosystem services and functions

Result - societal benefits that go beyond “just” managing stormwater runoff... Increase resiliency and correct environmental impacts.

Examples of MS4 WIP Projects

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Reduce Water Quality and Flooding
Impacts

Repair Impaired Ecosystems
Restore Services and Functions

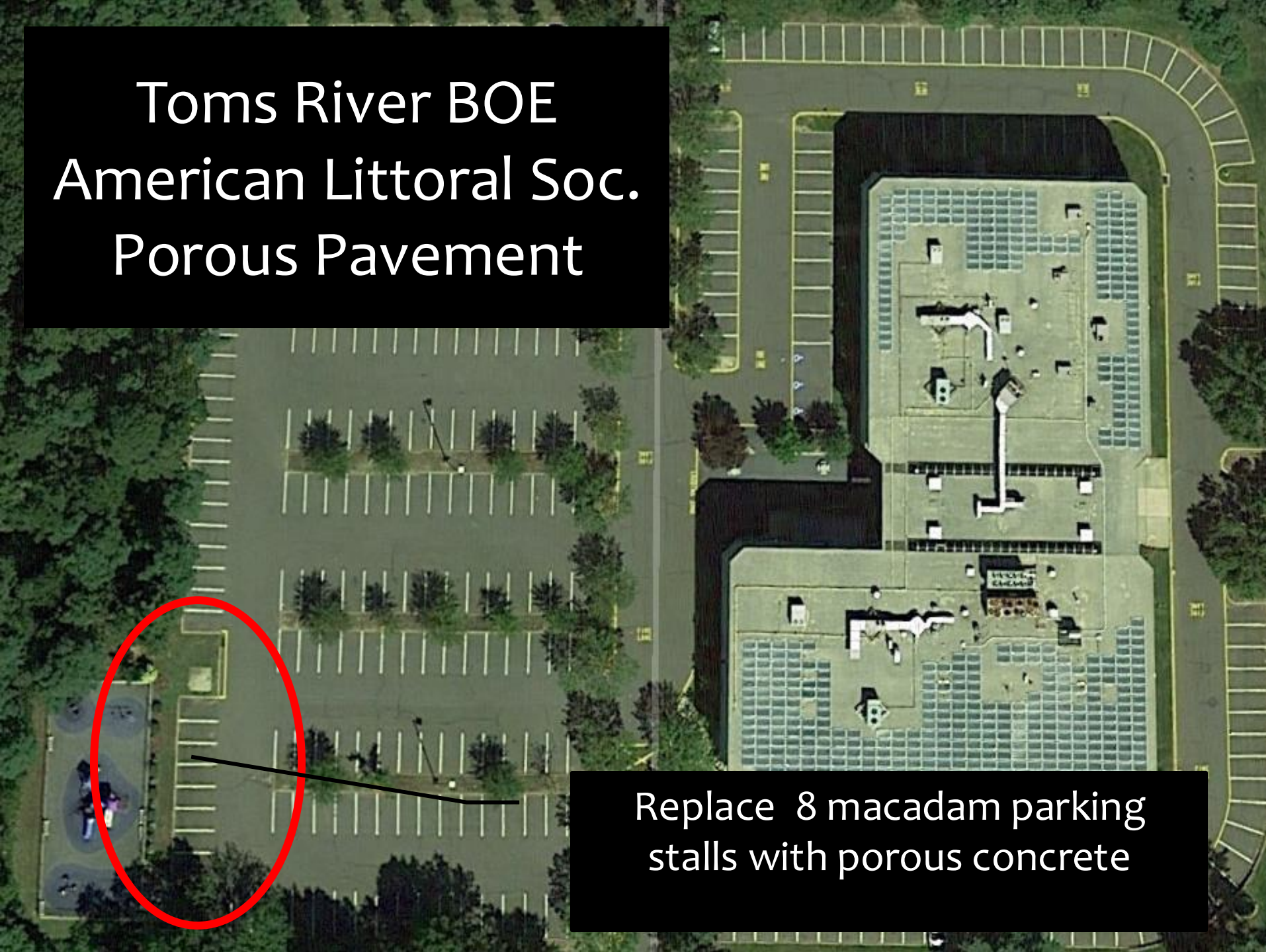
REDUCE

Thinking Small For Big Results...

Example Projects

- Emphasize 1-year (2.75”) and 2-year (3.3”) events... manageable and cost effective... responsible for majority of WQ impairments and repetitive, nuisance flooding
- Use mix of Green/Gray and Green MS4 type solutions:
 - Porous pavement
 - Tree boxes, Catch basin inserts, Small MTDs
 - Rain barrels
 - Rain gardens

Toms River BOE American Littoral Soc. Porous Pavement

An aerial photograph of a large parking lot and a multi-story building. The parking lot is filled with rows of parking stalls. A red circle is drawn around a specific section of the parking lot, and a black line points from this circle to a text box. The building has a flat roof with several HVAC units and a sign that reads "American Littoral Society".

Replace 8 macadam parking stalls with porous concrete

Project Details

- Portland cement, open-graded aggregate porous pavement facilitates infiltration.
- Aggregate sub-base provides containment/detention.
- Post-installation testing showed runoff seeps into underlying sandy soils $> 10''/\text{hr.}$ = 500 year event!
- Total cost ~ \$20,000.
- Funding thru 319(h)

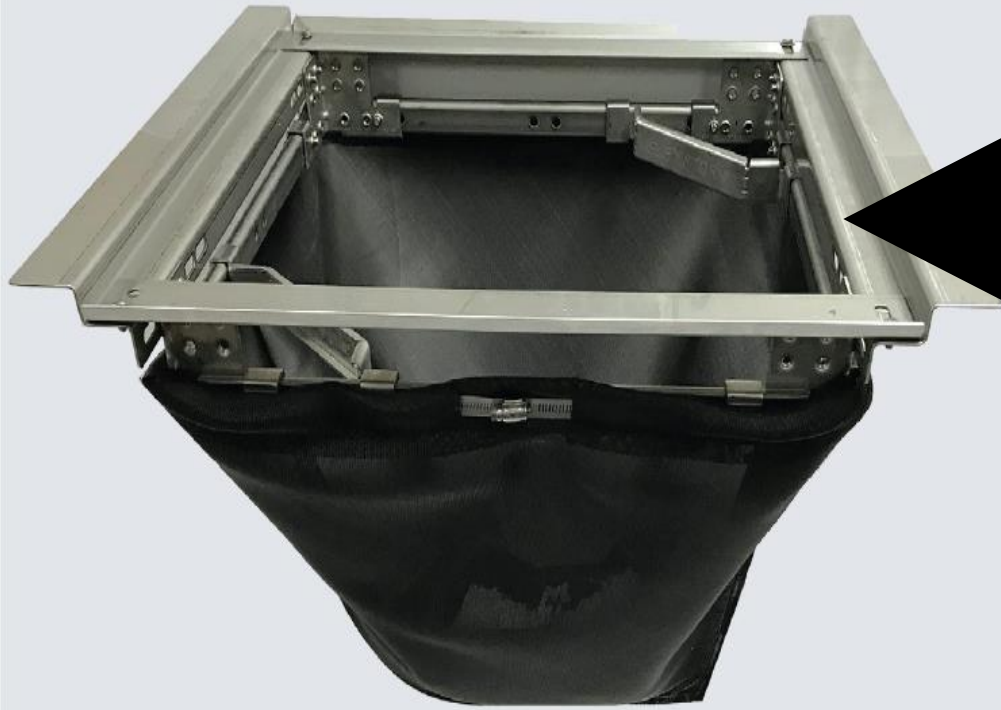


Culver Lake Catch Basin Retrofit



Private/Public Project – GCLWCF, NAI and Frankford Township

Flex Storm Catch Basin Inserts



Stainless steel frame
adaptable to various size
catch basins... Approx
\$1,500/insert

Removes sediment, leaf
litter, and other
particulates

Treats runoff generated by
1-yr event and 1st flush of
larger storms

5-6 Ft³ capacity
Capable of 99% TSS
removal @ flow rate of 137
GPM/Ft²

Catch Basin Filter Maintenance



58 basins modified watershed-wide.

Cleaned out 2-3 x annually depending on size of insert, size of catchment area and observed volume of accumulated material

Vacuum truck used by Frankford DPW loaned from Andover .

Rain Barrels

- Good kickoff project for community involvement.
- “Gateway drug” for bigger and better SW Mgmt. techniques.
- Beneficial reuse e.g. landscape irrigation, fire suppression
- Scalable 50 – 100,000 gal



Rain Gardens - Highly Scalable Solutions



GREEN INFRASTRUCTURE GUIDANCE MANUAL

FOR NEW JERSEY



http://water.rutgers.edu/Green_Infrastructure_Guidance_Manual/2015-03-31_Manual.compressed.pdf



Culver Lake Community Rain Garden

Before



After- Prior to Planting

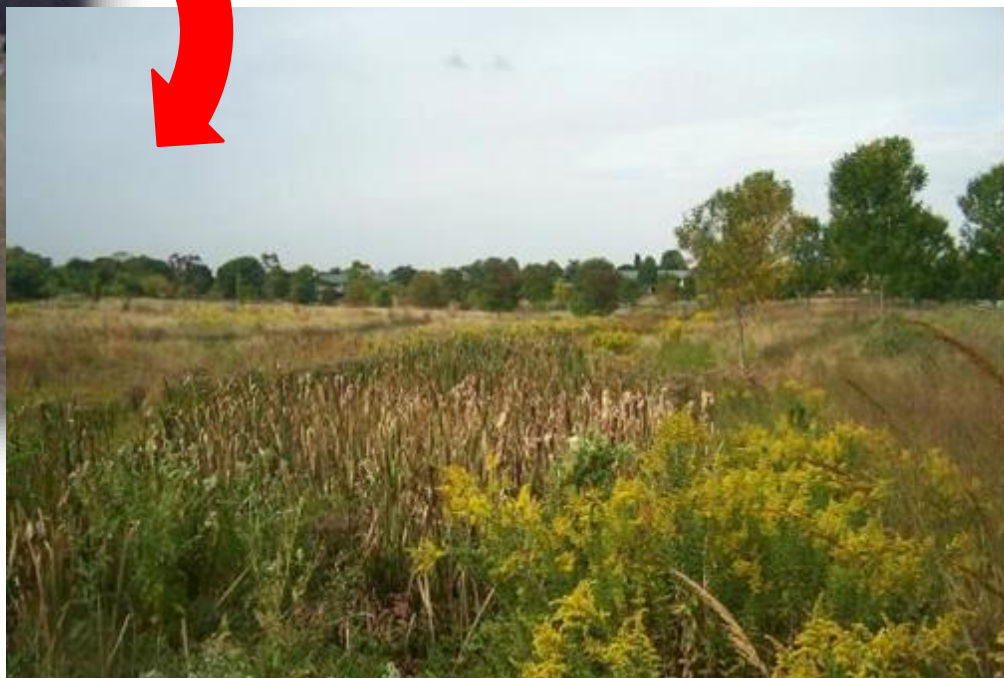




Wallkill River Watershed Management Group/ Eagle Scout project.
Led to several additional installations at homes around Culver Lake.

RETROFIT

Improve Performance of Existing SWM Systems



Detention to Bioretention

Asbury Park Main Street Bus Station

Converted
existing detention
basin into
bioretention basin

Volunteer planted

Deal Lake
Commission
319(h) funding



Clawson Park, East Amwell

- Headwater of Back Brook (Raritan drainage)
... nutrient, sediment and FC impairments.
- Existing conventional stormwater detention basins provided inadequate management.
- Park subject to frequent localized flooding.
- Retrofit basin to retain runoff, decrease nutrient loading, decrease nuisance flooding, improve aesthetics.

Starting Conditions Upper Basin



Basin Renovation - Strip Turf and “Dig-Drop” to Loosen Compacted Soils



Incorporate Organic Material



Upper Renovated Basin - Summer



Upper Renovated Basin - Fall



Upper Renovated Basin - Winter



After Seasonal Mowing
Following Major Storm March 2020

Post 6"-6 hr. Rainfall 19 July 2021

Conditions 24 hours later



Renovated
basin

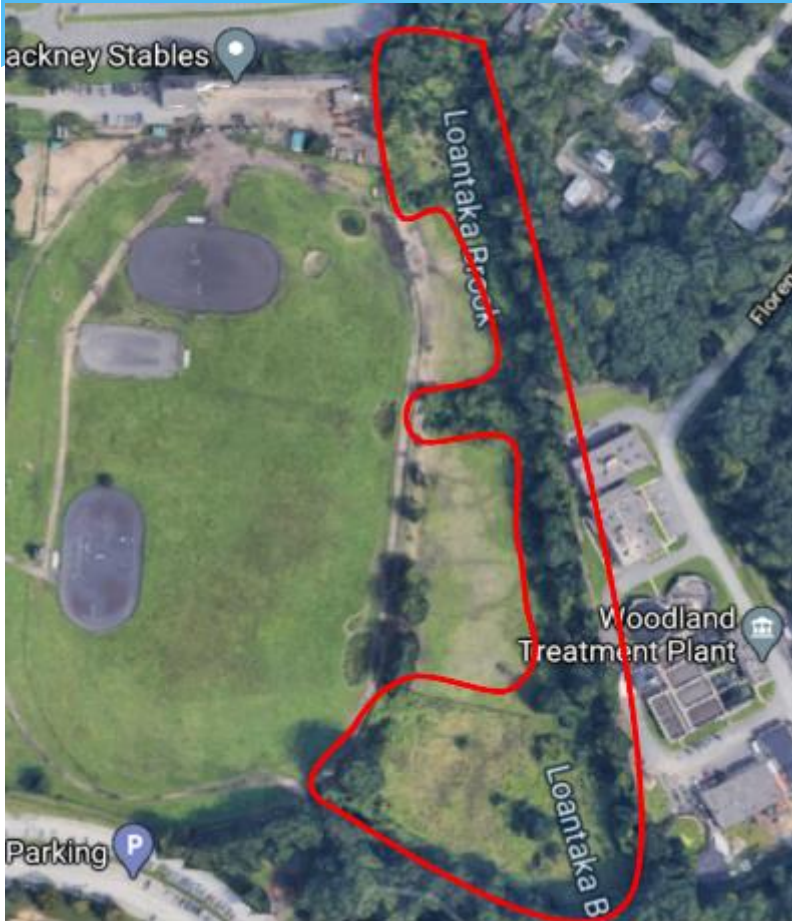
Post 6"-6 hr. Rainfall 19 July 2021 Conditions 24 hours later



Conventional
Detention Basin

RESTORE

Wetlands, Floodplains, Riparian Areas



- Princeton Hydro and Amy Green Environmental
- Convert portion of eroded paddock into 1/2 mile forested riparian buffer
 - Minor regrading to reconnect stream to restored floodplain
 - 319(h) funding

RESTORE

Wetlands, Floodplains, Riparian Areas



- North Jersey Resource Conservation & Development and Princeton Hydro
- Stream scour repaired
- Stream reconnected to natural floodplain
- Flood mitigation wetland created
- Funding thru NJ Wetland Mitigation Council

Walnut Brook, Mine Brook Park, Flemington, NJ
Stream Restoration and Floodplain Reconnection

RESTORE

Wetlands, Floodplains, Riparian Areas



Walnut Brook, Mine Brook Park, Flemington, NJ
Stream Restoration and Floodplain Reconnection

For More Information - ANJEC

Facts

- Stormwater accounts for 60% of pollution that enters our waterways.
- 2018 was the wettest year in NJ with an average of 64.09 inches of precipitation.
- Superstorm Sandy (2012) caused \$36.8 billion dollars in damage in NJ.
- \$40 billion investment is needed to fix NJ water infrastructure including Stormwater (SW) management.



Establishing a Stormwater Utility Helps Manage SW!

A Stormwater Utility (SWU) is a public utility that assesses fees in an equitable fashion based on a property's impervious surface. These fees can only be used for stormwater management. Counties, municipalities and utility authorities are permitted to form a SWU in NJ.

Primary brochure information sources- News articles and NJDEP websites

Resources

WATER & STORMWATER

Enhanced SW Management Model Ordinance
<https://thewatershed.org/wp-content/uploads/2020/07/TWI-Enhanced-Ordinance-highlights-final.pdf>

Municipal Stormwater Regulation and MS4 Program
<https://dep.nj.gov/njdep-stormwater/municipal-stormwater-regulation-program/>

Water Resource Management
<https://www.nj.gov/dep/wrm/>

Clean Water NJ <https://dep.nj.gov/cleanwater/nj/>

AmeriCorps Watershed Ambassador Program
<https://www.nj.gov/dep/wms/bears/ameriCorps.htm>

STORMWATER UTILITY

NJ Stormwater Utility Law
<https://www.billtrack50.com/BillDetail/933113>

Flood Defense NJ
<http://flooddefense.nj.org/>

NJ Future Stormwater Utility Resource Center
<https://stormwaterutilities.njfuture.org/>

GREEN INFRASTRUCTURE

New Jersey Developer's Green Infrastructure Guide
<https://developersguide.njfuture.org/>

New Jersey Future GI Municipal Toolkit
<https://gitoolkit.njfuture.org/>

ANJEC Stormwater Management for Municipalities: Green Infrastructure designs and options - found under publications <https://anjec.org/publications/>

ANJEC Municipal Techniques: Long term control plans, stream daylighting and combined sewer overflow programs - under publications <https://anjec.org/publications/>

Rutgers Green Infrastructure Manual

<https://tinyurl.com/2fi23kyd>

✉ info@anjec.org

🌐 <https://anjec.org/>

📘 @anjecpage

▶ @anjecviews5871



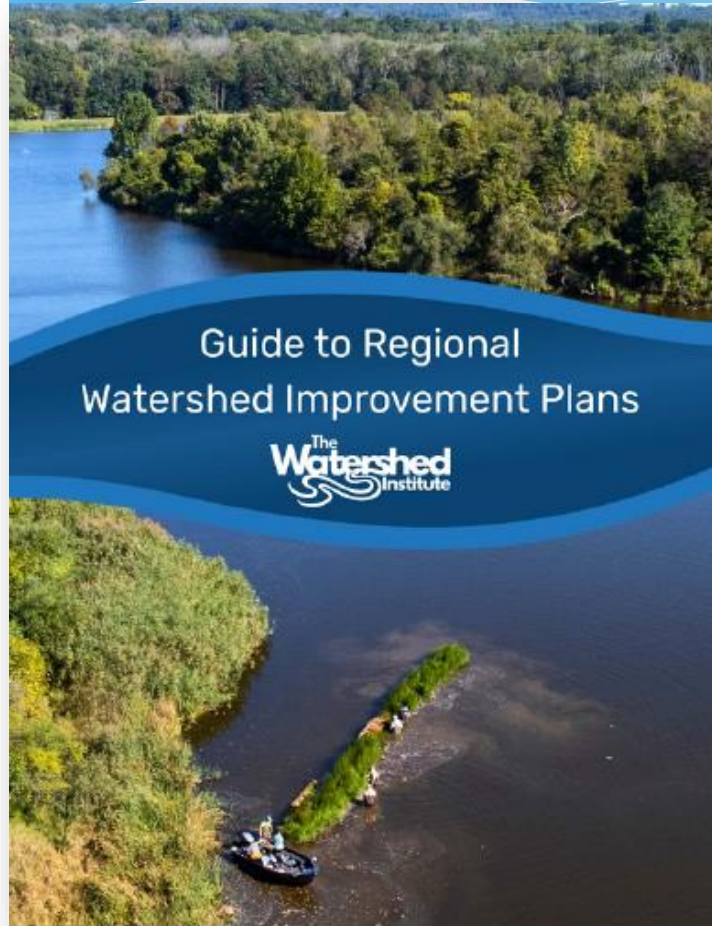
Managing Stormwater



Stormwater (SW) runoff is precipitation rain, snow, sleet) that runs off hard surfaces like pavement, sidewalks, and roofs. As a result SW carries and transports pollutants (trash, motor oil, fertilizers, pet droppings, etc) into storm drains which generally are NOT treated before draining directly to rivers, streams, and lakes.



More Information



UNDERSTANDING THE NEW MS4 PERMIT

A PRIMER FOR NEW JERSEY MUNICIPALITIES



IN COLLABORATION WITH
ONE WATER
CONSULTING LLC



<https://www.anjecnews.com/formunicipalities.html>

<https://dep.nj.gov/njpdes-stormwater/municipal-stormwater-regulation-program/>

Use Four R's of MS4 Compliance To Take the Bite Out of Stormwater Runoff!



Thank You... Questions

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