

# Helping Municipalities Manage Stormwater & Meet State & Federal MS4 Requirements

Heather Fenyk, Ph.D., AICP/PP  
Lower Raritan Watershed Partnership



*The LRWP listens to your stormwater management needs!*

## As we work to meet our nation's "fishable" and "swimmable" water quality goals per the federal Clean Water Act, what must we do at the state level to meet Stormwater Management Requirements?

### HAPPY 50th BIRTHDAY, CLEAN WATER ACT!

(October 18, 1972 - October 18, 2022)

#### §1251. Congressional declaration of goals and policy

##### (a) Restoration and maintenance of chemical, physical and biological integrity of Nation's waters; national goals for achievement of objective

The objective of this chapter is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. In order to achieve this objective it is hereby declared that, consistent with the provisions of this chapter—

(1) it is the national goal that the discharge of pollutants into the navigable waters be eliminated by 1985;

(2) it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water be achieved by July 1, 1983;

(3) it is the national policy that the discharge of toxic pollutants in toxic amounts be prohibited;

(4) it is the national policy that Federal financial assistance be provided to construct publicly owned waste treatment works;

(5) it is the national policy that areawide waste treatment management planning processes be developed and implemented to assure adequate control of sources of pollutants in each State;

(6) it is the national policy that a major research and demonstration effort be made to develop technology necessary to eliminate the discharge of pollutants into the navigable waters, waters of the contiguous zone, and the oceans; and

(7) it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this chapter to be met through the control of both point and nonpoint sources of pollution.

Per federal regulations, each municipal stormwater program must address 6 Minimum Control Measures (MCMs) that are considered essential for successfully reducing stormwater pollution:

1. **Public Education & Outreach**
2. Public Participation and Involvement
3. Illicit Discharge Detection and Elimination
4. Construction Site Runoff Control
5. Post-Construction Stormwater Management in New Development and Redevelopment
6. Pollution Prevention and Good Housekeeping for Municipal Operations and Maintenance

The LRWP is prepared to assist Lower Raritan municipalities meet their **Public Education & Outreach MCM**:

- We work in partnership with our communities to implement at least 12 E&O points focused on improving public awareness of causes of stormwater pollution & on the stormwater ordinances that help improve water quality in municipal waterways



# About the Lower Raritan Watershed & the Lower Raritan Watershed Partnership

## Restoring the Raritan through Stewardship & Science

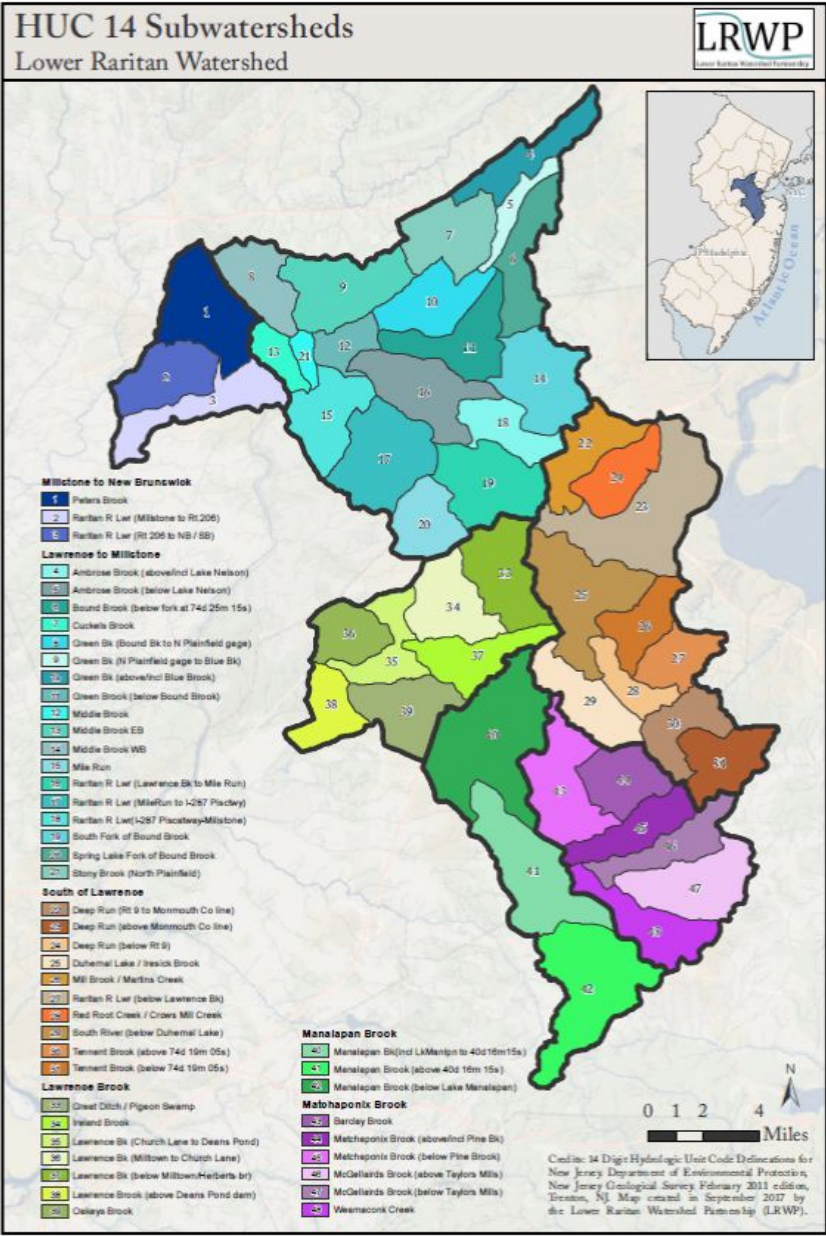
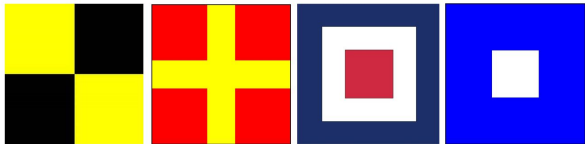
The Lower Raritan IS Central New Jersey!

Part of the NY/NJ Harbor Estuary, the 352 square mile Lower Raritan Watershed is under the jurisdiction of 54 municipalities and 4 counties.



The LRWP vision:

A healthy Raritan River and Lower Raritan Watershed community, restored and sustained through collaboration, participatory science, and stewardship.



# A (Lower Raritan) watershed perspective on stormwater management & water quality / water quantity impacts



Taking a big picture view to stormwater management & watershed health

*Photo credit: Alison M. Jones, with thanks to Light Hawk LLC*

## CONTEXT

- Understanding human & environmental health risks
- Water quality monitoring & reporting: to inform communities of risks and to track changes and trends over time

## ACTION:

- MS4 program support to municipalities for Education & Outreach
- #lookfortheriver: support new interactions between people, the built environment and the natural landscape



## Understanding Human & Environmental Health Risks: Stormwater Impacts on Health & Safety

**Nonpoint source pollutants carry litter & disease-causing pathogens into our stormwater infrastructure**



**...ruining our special places**  
*Image: Trash in the Green Brook*



**...polluting our drinking water**  
*Image: algae-covered pond at Duke Farms, 2018*



**...and killing our fish and wildlife**  
*Image: fish kill in South Amboy, 2018*



**Poor stormwater management leads to wet basements and dangerous flooding conditions**



*Image: Flooding on Joyce Kilmer Avenue in New Brunswick after a .5 inch rainstorm, August 10, 2022*

**...putting other infrastructure at risk of failure**



*Image: 30-foot Sinkhole on George Street in New Brunswick (2018)*



*Image: South Amboy Sinkhole (Police photo, 2015)*



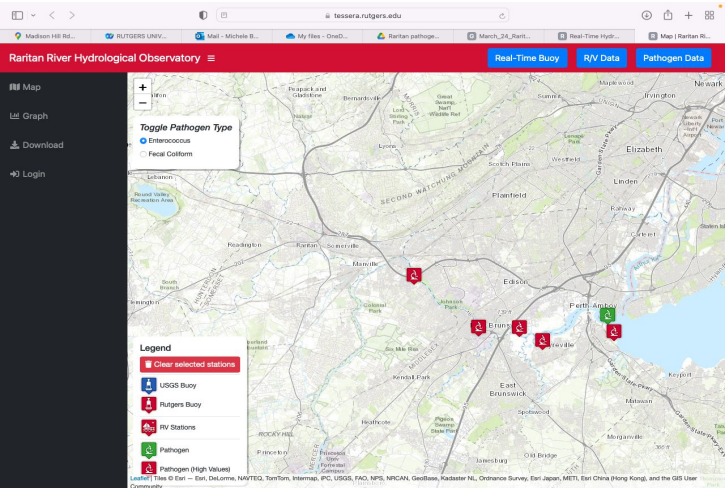
# Water quality monitoring & reporting: Making the link between water quality and stormwater management

Every week during summer months the LRWP and partners sample water at sites along the Raritan River to test for disease causing pathogens carried by stormwater and other sources.

We test for fecal contamination and presence of Enterococcus bacteria.

We communicate our findings in multiple formats and in English, Spanish, and via symbols recognizable for non-English / Spanish / verbal populations.

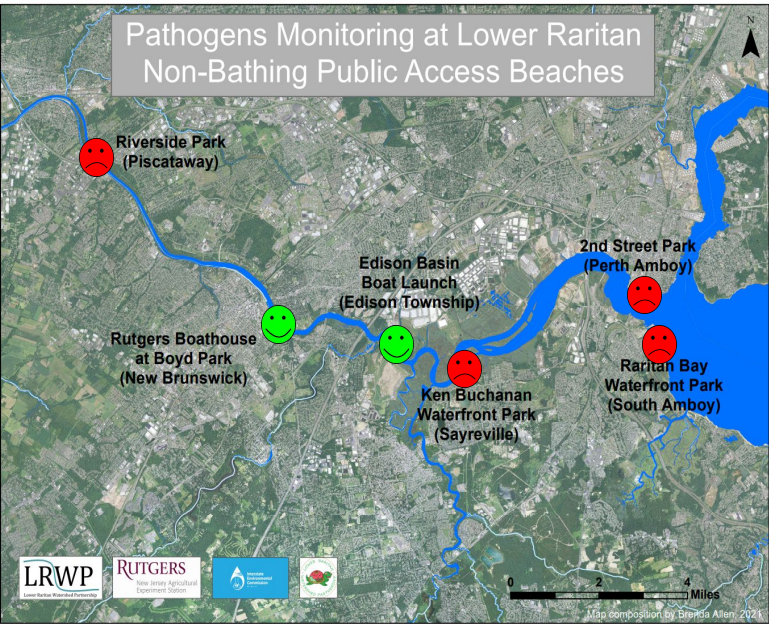
And we work to: 1) identify genetic source of pathogens; and 2) track down upstream causes of contaminants.



<https://tessera.rutgers.edu/rrho/>



★ Sitios de Monitoreo en el Río Raritan Inferior



Raritan River Pathogens Monitoring Results for 9/23/2021:

Site Name	Time sampled	Enterococcus in CFUs	Fecal Coliform in CFUs	Status
Riverside Park	8:18 AM	130	150	🔴
Rutgers Boathouse	8:50 AM	41	180	🟢
Edison Boathouse	9:17 AM	47	120	🟢
Ken Buchanan Waterfront Park	9:55 AM	380	440	🔴
South Amboy Waterfront Park	10:27 AM	2400	4100	🔴
2nd Street Park	11:127 AM	1800	600	🔴

Enterococci results are reported in Colony Forming Units or CFUs.  
Suitable enterococci levels for primary contact should not exceed 104 cfu/100mL  
\*\*TNTC = too numerous to count \*\*  
These results are preliminary and awaiting Quality Control.



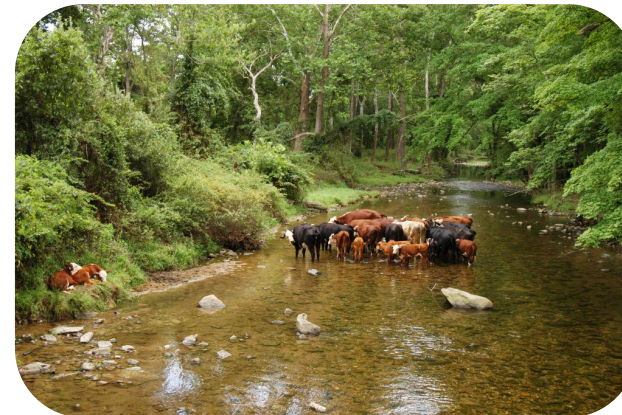
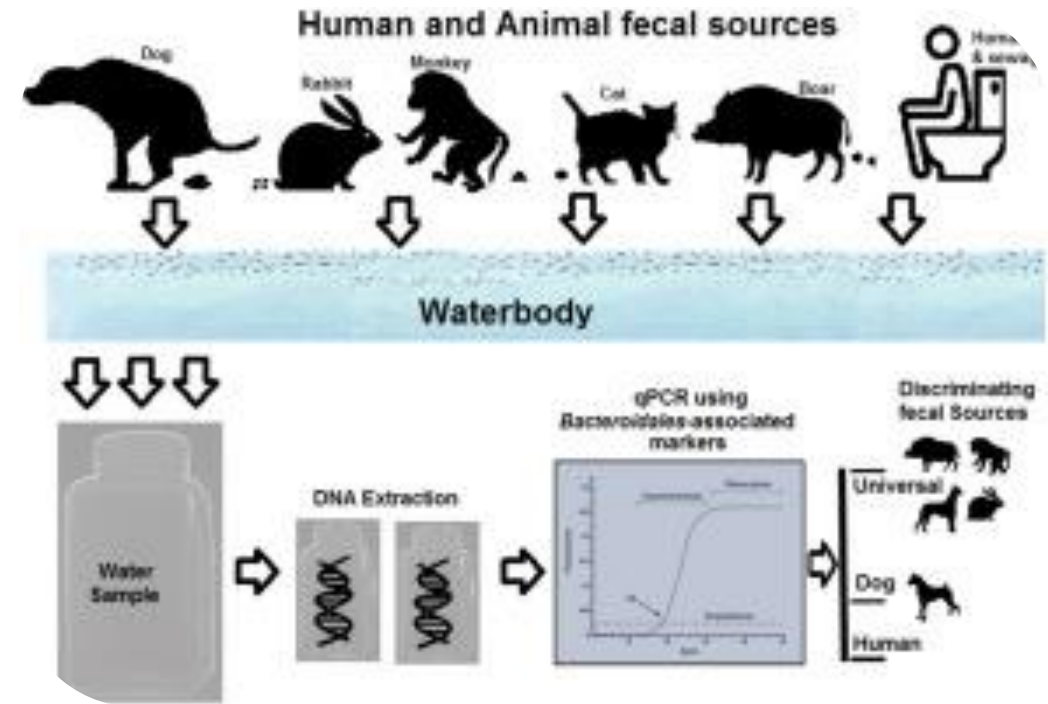
# Understanding water quality impacts: How does Enterococci end up in our waters?

And...why does source matter?

## Sources of fecal contamination:

stormwater runoff, broken sewer lines,  
Combined Sewer Overflows (CSOs), animal  
waste

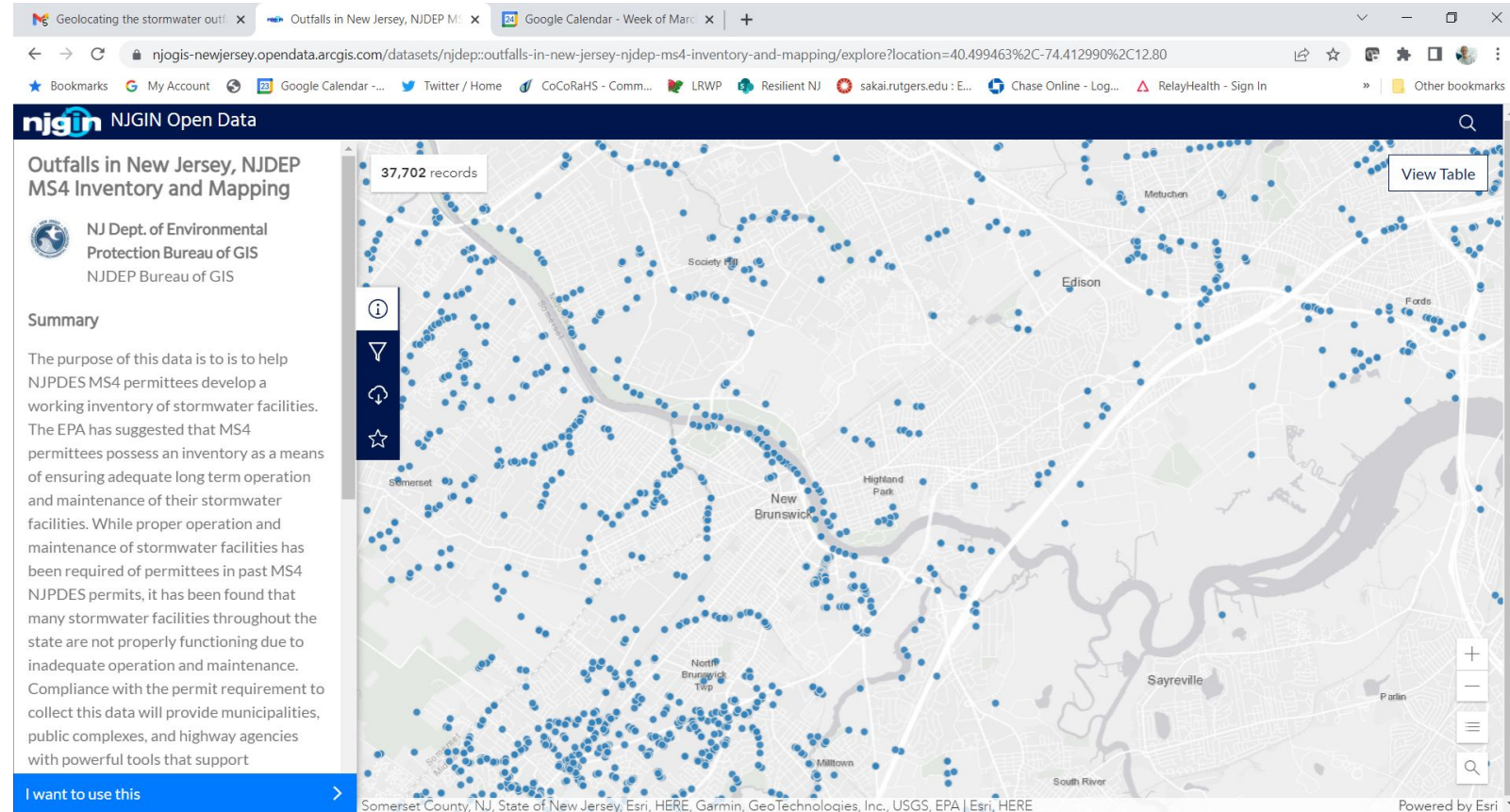
*If we know the source, we can address the problem!*



# Taking Action to Address Water Quality Issues: 2022-2025 Monitoring & Outreach Goals

- Pathogens sampling at non-bathing public access beach sites & reporting
- Continue partnership w/ EPA for transect sampling and genetic source trackdown
- “Ground truthing” by kayak of failing sanitary sewage infrastructure/stormwater infrastructure
- **MS4 Stormwater Management Assistance: making link between water quality, land use decisions, and policies**

## Outfalls in New Jersey, NJDEP MS4 Inventory and Mapping



<https://njgis-newjersey.opendata.arcgis.com/datasets/njdep::outfalls-in-new-jersey-njdep-ms4-inventory-and-mapping/about>



# Taking Action on Stormwater: A multi-pronged approach to fishable, swimmable waters



THE CITY OF  
NEW BRUNSWICK

## MS4 program support to municipalities for education & outreach:

- General Public Outreach
- Target Audience Outreach
- School/Youth Education & Activities
- Watershed Regional Cooperation
- Community Involvement Activities

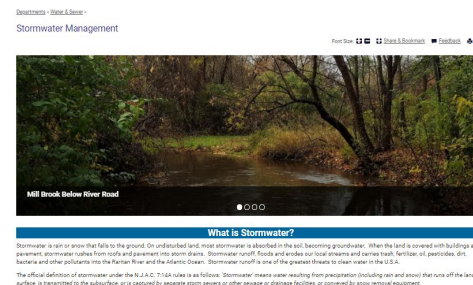
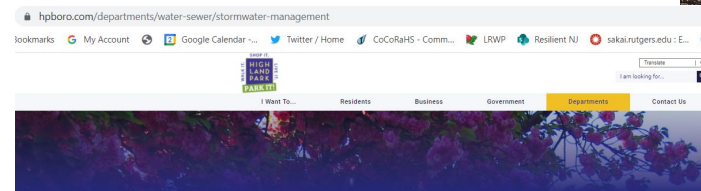


<https://www.youtube.com/watch?v=a1pGUwBf8-w>

*Mile Run Brook: the music video!*



<https://www.hpboro.com/departments/water-sewer/stormwater-management>



Water quality monitoring & identification of interventions:  
Convergence of stream flow (Highland Park's Mill Brook).

Note sedimentation on left - direct flow from culvert.  
Note clearer stream on right - flow through forested buffer.



*Storm drain  
mapping with New  
Brunswick youth*



Rethinking Water Flow

Storm Drains Can Cause Problems



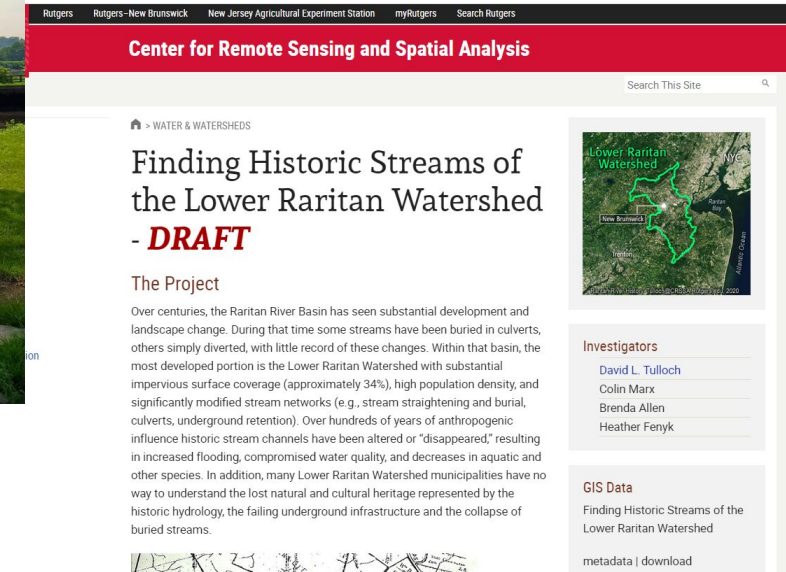
# #lookfortheriver

#lookfortheriver: new interactions between people, the built environment and the natural landscape

- Boyd Park FRAME, crowdsourcing data about the landscape
- mapping our historic buried and culverted streams
- training on how to read a topographic map, identify watersheds & find hidden streams
- Rock Dance Collective choreographed work envisioning the reemergence of our buried streams
- “The Run Off” collaborative public stormwater flows performance planned for 2023



[Resources](#)  
[Contact Us](#)  
[Directions](#)





**NEW 2023 MS4 Requirements:**

- Dedicated stormwater education & outreach webpage
- MS4 Infrastructure GIS Mapping
- Tree Ordinance & Salt Storage Ordinance
- Watershed Improvement Plan



**THANK YOU!!**

<https://lowerraritanwatershed.org/>