



Inventory and Assessment of Stormwater Infrastructure



Stormwater Management

- ▶ [Green Infrastructure in NJ](#)
- ▶ [Stormwater Management Rule](#)
- ▶ [Stormwater Management Rule FAQs](#)
- ▶ [NJ Stormwater BMP Manual](#)
- ▶ [Maintenance Guidance](#)
- ▶ [BMP Manual Chapters for Comment](#)
- ▶ [MTD Certifications and Guidance](#)
- ▶ [Additional Guidance Documents](#)

Welcome to NJDEP's stormwater web site for stormwater management professionals and permittees. Here you'll find links to technical information, guidance materials, forms, and applications. General guidance and resources regarding stormwater runoff are also available at www.cleanwaternj.org.



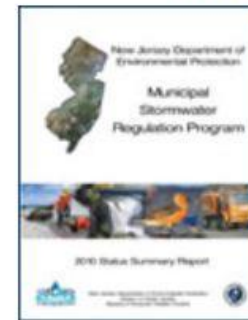
Stormwater Permitting

- ▶ [Municipal Stormwater Regulation](#)
- ▶ [General Stormwater Permits](#)
- ▶ [Individual Stormwater Permits](#)
- ▶ [Permit Applications and Checklists](#)

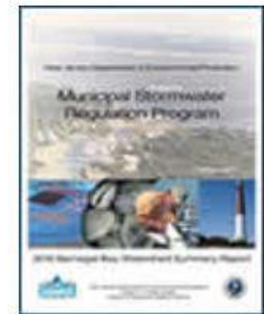
Program Links

- ▶ [NJ Stormwater.org Contacts](#)

Featured Topics



Municipal Stormwater Regulation Program
2010 Status Report
Summary



Municipal Stormwater Regulation Program
2010 Barnegat Bay Watershed
Summary Report

Recent News

- ▶ [Maintenance Guidance](#)
- ▶ [Stormwater Training](#)
- ▶ [2 New and 5 Updated NJ Stormwater BMP Manual Chapters](#)
- ▶ [Green Infrastructure in NJ](#)
- ▶ [Snow Removal and Disposal Policy](#)

Identifying and Assessing Stormwater Infrastructure

Before an assessment can be completed, stormwater infrastructure must be located and identified such as:

- Detention Basins
- Retention Basins
- Other Stormwater Best Practices Management (BMPs)
- Manufactured Treatment Devices (MTDs)
- Catch Basins
- Stormwater Piping
- Outfalls

Other Stormwater Management Practices



Bioretention Systems

Other Stormwater Management Practices



Constructed Wetlands

Other Stormwater Management Practices



Infiltration Basin

Other Stormwater Management Practices



Pervious Paving Systems

Other Stormwater Management Practices



Parker Urban Greenscapes. 2009.

Rooftop Vegetated Cover

Other Stormwater Management Practices



Sand Filters

Other Stormwater Management Practices



Grass Swales

Other Stormwater Management Practices



Dry Wells

Other Stormwater Management Practices



Manufactured Treatment Devices (MTDs)

The Benefits of Stormwater Infrastructure Inventory and Assessment

- ✓ Identify maintenance needs
- ✓ Reduce replacement and repair needs
- ✓ Reduce liability
- ✓ Support development of alternative maintenance programs
- ✓ Translate into reduced long-term costs

Improved Maintenance Results

- ✓ Reduced pollution of local waterways
- ✓ Reduced stream channel erosion
- ✓ Reduced flooding
- ✓ Enhanced climate resiliency

State Regulations: Outfall Mapping and Illicit Connections



State Regulations: Outfall Pipe Stream Scouring Remediation



What Other Stormwater Facilities to Inventory

- ✓ Stormwater management basins
- ✓ Outfalls pipes
- ✓ Subsurface retention/detention systems
- ✓ Manufactured treatment devices (MTDs)
- ✓ Green infrastructure

Beyond State Regulations – Mapping Catch Basins and Piping



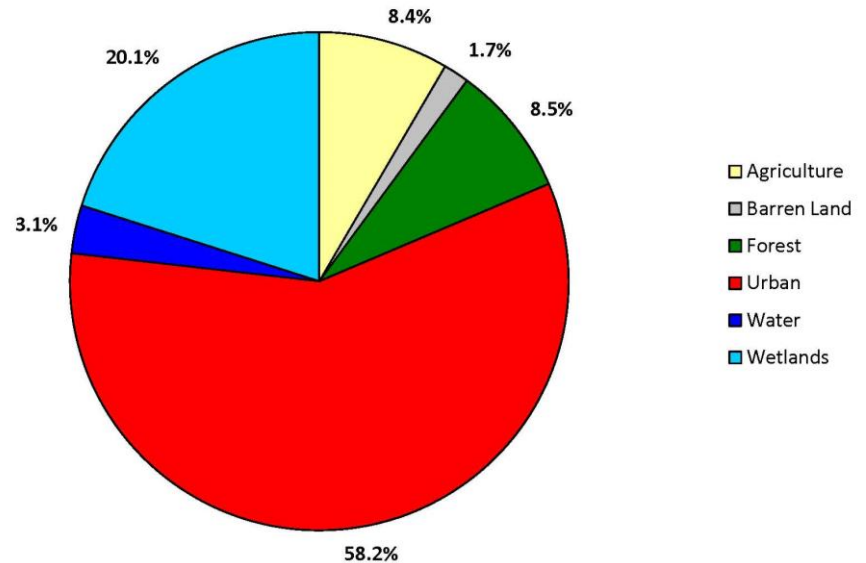
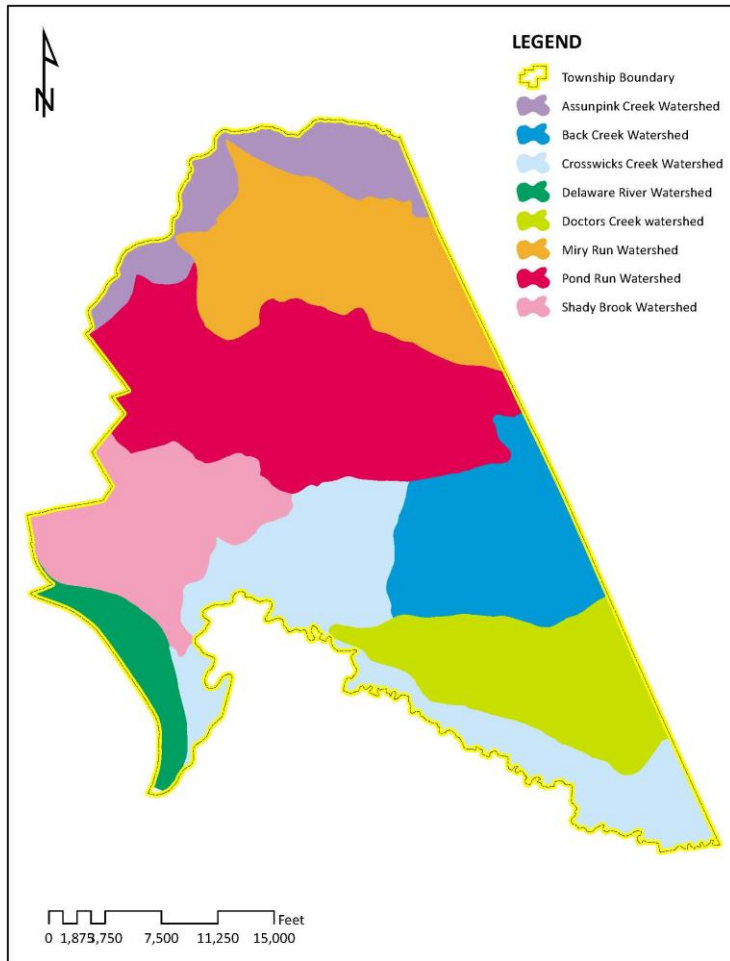
Minimum Information Collected in an Inventory

- ✓ Type of Stormwater Facility
- ✓ Coordinates in accordance with NJDEP GIS Protocol
- ✓ Road Name
- ✓ Owner
- ✓ Tax Map Number
- ✓ Block and Lot
- ✓ Unique Identification Number

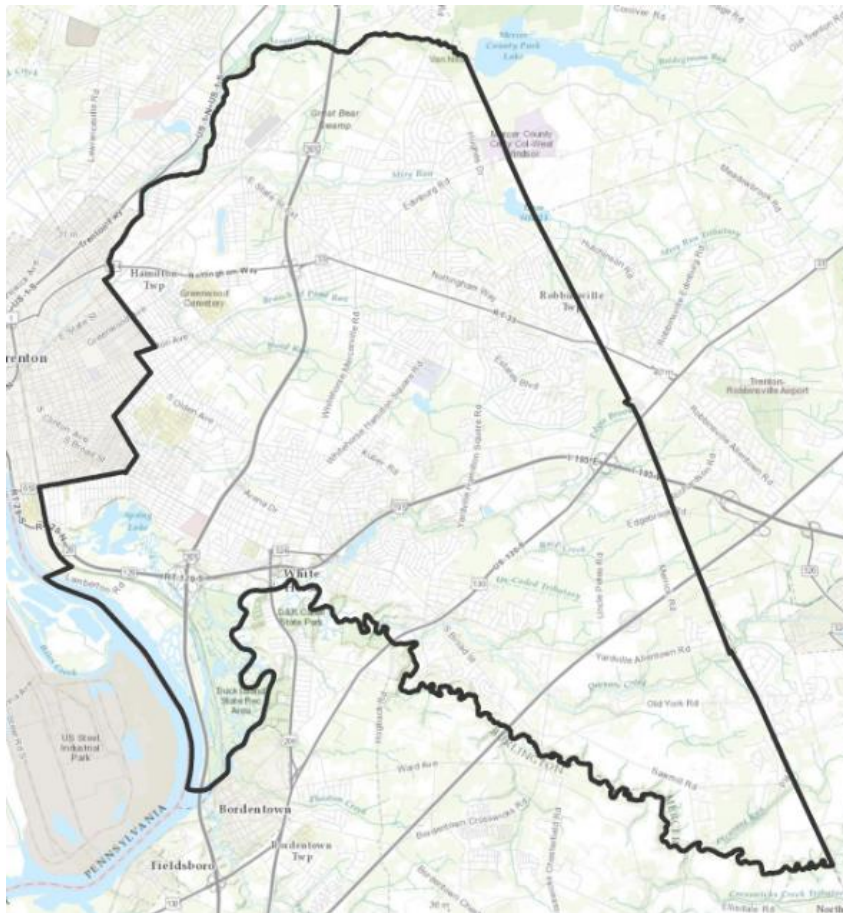
Mapping



Inventory and Assessment Case Study: Hamilton Township



Hamilton Township



Inventory Forms



Stormwater Infrastructure Assessment Program Stormwater Basin Inspection Checklist



GENERAL INFORMATION		Site ID:
Name(s) person inspecting the basin:		Date:
Location Address and Cross Streets:	Watershed:	
Name of Creek, Stream, or area into which the basin discharges:	Property Owner / Tax Parcel Block & Lot:	
Contact information:		
STRUCTURAL COMPONENTS		
Basin description, size and depth:	Is the basin accessible to maintain? Yes / No	
	Is it maintained: Mowed, clear of woody plants, inlet/outlet blockages?	
Number of inlets:	Outlet diameter:	

GENERAL OBSERVATIONS	YES	NO	NOTES/REMARKS
1) Any reports on the basin not functioning?			
2) Are there any unauthorized or malfunctioning structures in the basin?			
3) Are there concrete low flow channels. Is the water entering the basin directly exiting the basin outlet without coming in contact with the basin bottom soil and vegetation?			
4) Is there standing water or evidence of standing water in the basin?			
INLET/S			
1) Signs of breakage, damage, corrosion or rusting of inlet structure/pipe?			
2) Debris or sediment accumulation in or around the inlet clogging the inlet opening/pipe?			
3) Signs of erosion, scour or gullies; rock or vegetation above or around the inlet structure?			
4) Tree roots, woody vegetation growing close to or through the inlet structure or a situation impacting the structure's integrity?			
5) If the inlet has a pretreatment structure (trash rack, forebay) is it filled w/ debris or sediment?			
BASIN			
1) Accumulation of debris or litter within basin?			
2) Exposed dirt or earth visible, are there areas without vegetation or where turf is damaged?			
3) Excess sediment accumulation in the basin?			
4) Basin walls/embankment eroded, slumping, caved or being undermined?			



Stormwater Infrastructure Assessment Program Stormwater Outfall Inspection Checklist



GENERAL INFORMATION		Site ID:
Name(s) person inspecting the outfall:		Date:
Location Address and Cross Streets:	Watershed:	
Name of Creek, Stream, or area into which the outfall discharges:	Property Owner / Tax Parcel Block & Lot:	
Contact information:		
STRUCTURAL COMPONENTS		
Outfall description:	Is the outfall accessible to maintain? Yes / No	
Outfall Material:	Is it maintained: Mowed, clear of woody plants, blockages?	
Weather over past 24 Hours:	Outlet diameter:	

GENERAL OBSERVATIONS	YES	NO	NOTES/REMARKS
1) Any reports on the outlet not functioning?			
2) Are there any unauthorized or malfunctioning structures connected to the outfall?			



Assessment Tool

Esri Collector Application

- Free mobile application
- No equipment to purchase
- Android and Apple Compatible
- Easy to use
- Easy to upload and share
- Available offline



Collector for ArcGIS

Collect and update data in the field

esri

Collector for ArcGIS

Esri

UNINSTALL UPDATE

50 THOUSAND Downloads

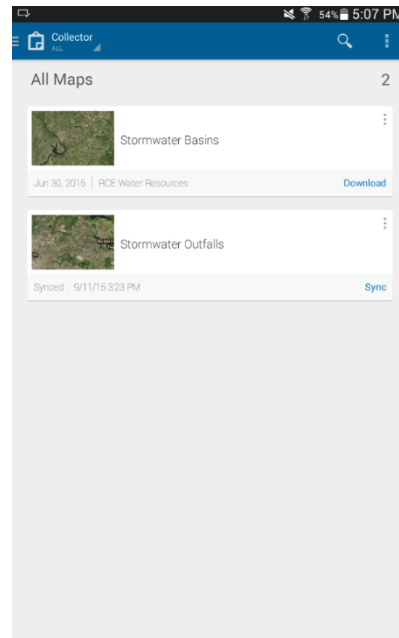
4.0 stars 638

Productivity

Similar

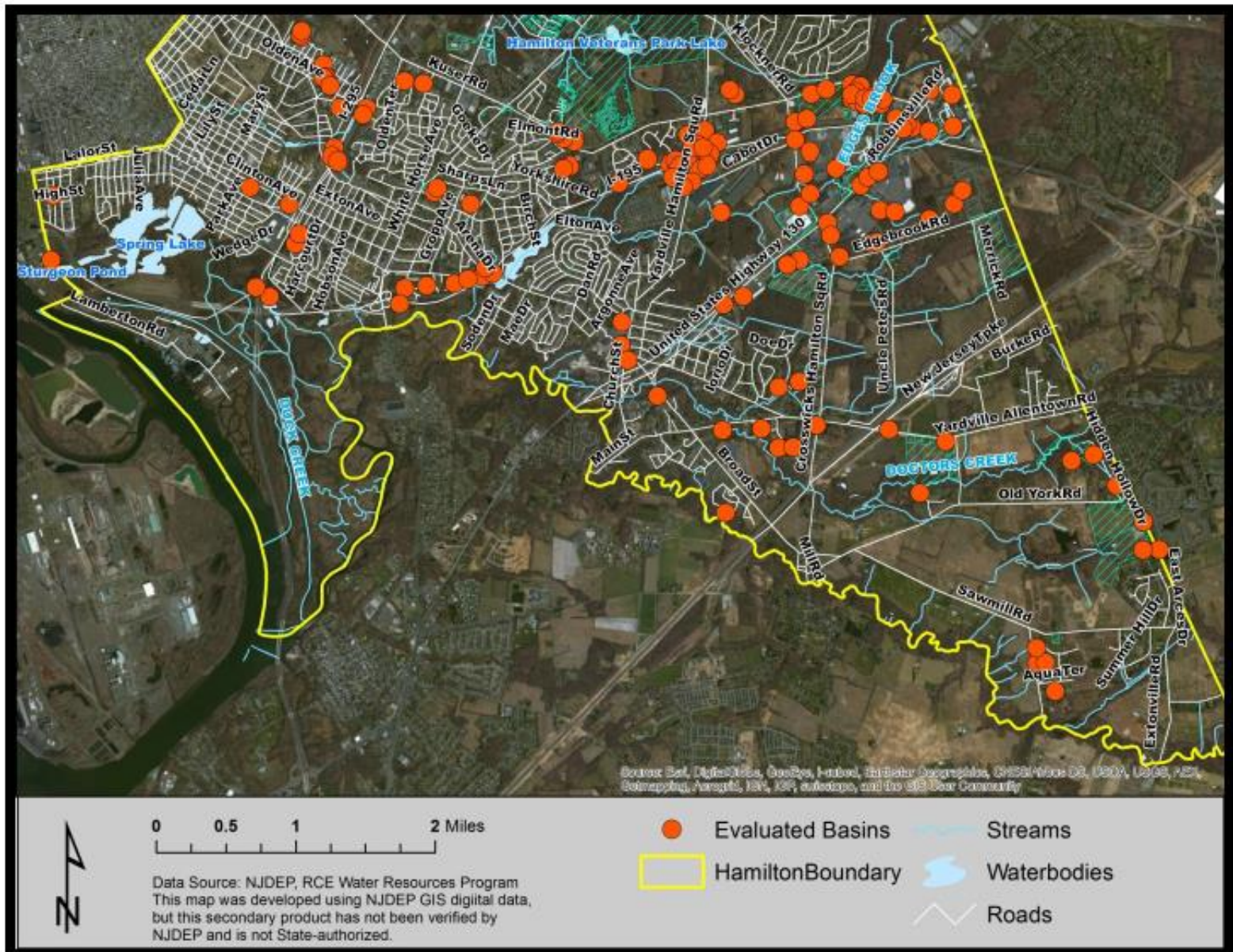
Using the Collector Application in four simple steps

- 1) Launch Collector
- 2) Choose Application
- 3) Tag Location
- 4) Answer Questions



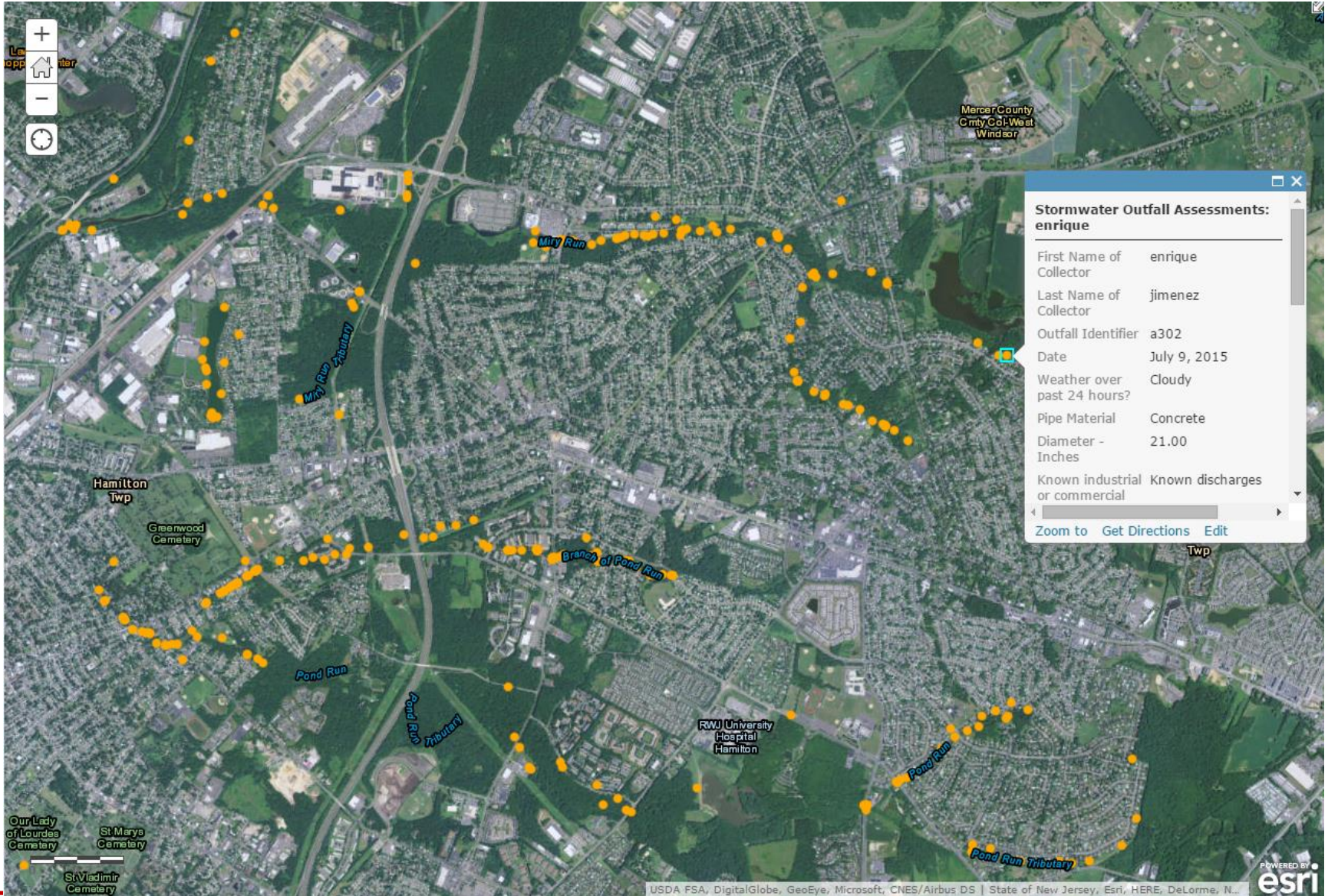
A screenshot of the data entry form in the Collector app. The title bar says 'Stormwater Basins'. Below it, there's a section titled 'Stormwater Basins:' with a 'No valid locations' message. The form has several input fields: COLLECTOR'S FIRST NAME, COLLECTOR'S LAST NAME, SITE IDENTIFICATION, DATE (with a dropdown menu showing 'September 15, 2015' and a 'Use current' button), ADDRESS, WATERSHED, NAME OF CREEK, STREAM, OR AREA INTO WHICH THE BASIN DISCHARGES, BLOCK NUMBER, LOT NUMBER, CONTACT INFORMATION, LAND USE THAT DRAINS TO BASIN, and PROXIMITY TO RESIDENTIAL HOUSING. The status bar at the top shows 56% battery and 4:57 PM.

Case Study: Hamilton Township

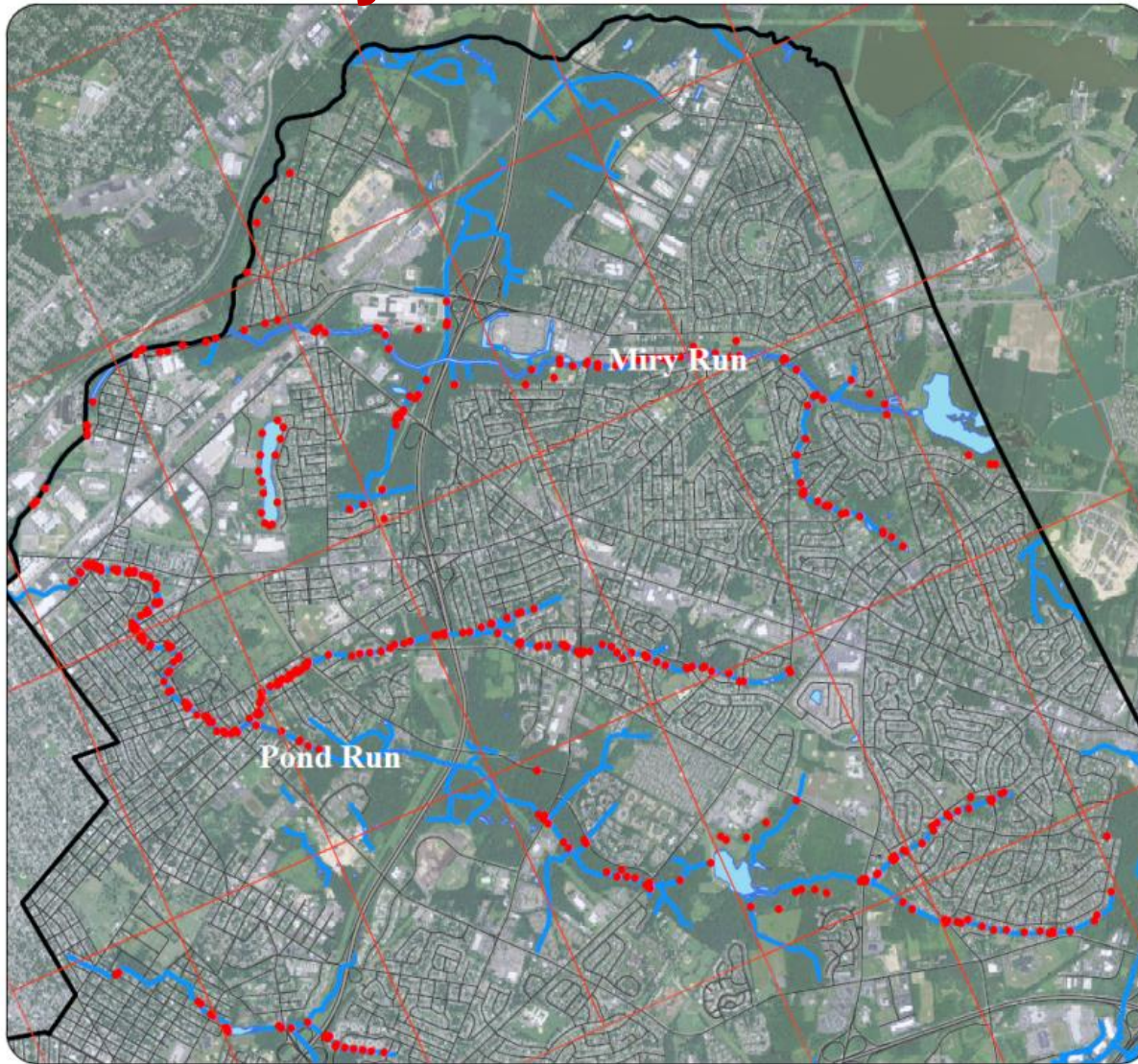


Case Study: Hamilton Township Results

A webmap that combines the geographic information with the answered question.



Case Study: Hamilton Township Benefits



0 0.25 0.5 0.75 1
Mile

- Outfall
- Waterbody
- Stream
- Roadway
- Hamilton

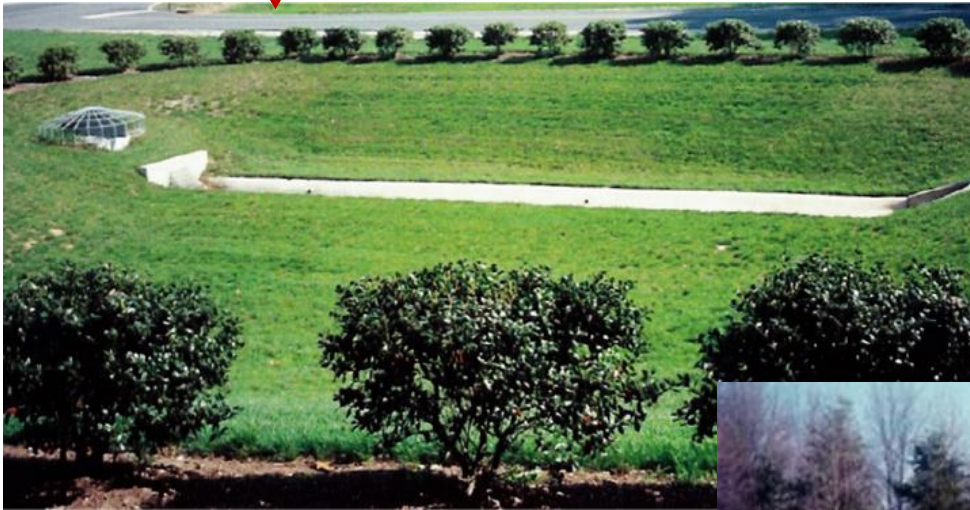
Map Creation:
Rutgers Water Resources Program
Data Sources:
NJDEP, NJDOT, USGS, Hamilton Township

Hamilton Township Stormwater Outfalls

Detention Basin vs. Retention Basin

Does the basin hold a permanent pool of water?

NO – Detention



YES –
Retention or
Wet Pond



Common Concerns with Detention Basins

1. Embankment and outlet stabilization
2. Sedimentation
3. Outlet blockages
4. Broken or clogged low-flow channels
5. Standing water or wet soils
6. Floatables and debris
7. Weeds or woody vegetation

#1 Embankment and Outlet Stabilization



Embankment
Destabilization



Outlet Destabilization

#2 Sedimentation



Accumulation of sediment in basin

#3 Outlet Blockage



Outlet blockage by debris



Outlet blockage by sediment

#4 Broken or Clogged Low-Flow Channels



Broken low-flow channel



Clogged low-flow channel

#5 Standing Water or Wet Soils



Standing water in detention basin

#6 Floatables and Debris



Accumulation of floatables in basin



Basin is a dumping ground

#7 Weeds and Woody Vegetation



Woody vegetation in basin



Invasive species have overtaken the basin

Common Concerns for Wet Ponds

- ✓ Embankment and outlet stabilization
- ✓ Outlet blockages
- ✓ Sedimentation
- ✓ Floatables and Debris
- ✓ **Lack of shoreline buffer**
- ✓ **Excessive algal growth**

Shoreline Buffer



Excessive Algae Growth



Wet Ponds in Good Condition



8.30.

Common Concerns with Stormwater Outfalls

1. Stream erosion or scouring resulting from discharge
2. Poor pipe condition
3. Discharge of floatables
4. Discharge of excessive sediment
5. Color of the water discharging
6. Discharging during dry weather conditions
7. Outfall overgrown with vegetation
8. Structural integrity of headwall or other supporting structure

#1 Stream erosion or scouring resulting from discharge



Outfall is causing erosion



Outfall is causing scouring

#2 Poor pipe condition



Crumbling concrete outfall pipe or pipe sections falling into stream

#3 Discharge of Floatables



Accumulation of floatables from outfall



Garbage in the stream

#4 Discharge of excessive sediment

Outfall pipes can discharge excessive sediment into the local waterway



#5 Color of the water discharging



Stormwater seems very cloudy – could be a cross connection with sanitary sewer pipe

#6 Discharging during dry weather



Could be an illicit connection – water quality testing should be done

#7 Outfall overgrown with vegetation



Outfall capacity is limited due to overgrowth of vegetation

#8 Structural integrity of headwall



Concrete headwall is crumbling

Inventory and Assessment Case Study: Hamilton Township



E-learning Tool Available

- A **FREE** interactive online E-learning tool is available
<http://water.rutgers.edu/E-learning.html>
- The tool showcase how municipalities can comply with the new MS4 permits

Inventory and Assessment of Your Stormwater Infrastructure Resources

Beyond State Regulations: Mapping Catch Basins & Piping



MS4: INSPECT AND CLEAN EVERY CATCH BASIN

Speaker icon | Play/Pause | Progress bar | Refresh | < PREV | NEXT >



Questions?

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