

Private Sector Perspectives on Overcoming Barriers with Green Infrastructure

Matthew Jones, PE, PhD
mjones@hazenandsawyer.com
919-833-7152

HAZEN AND SAWYER
Environmental Engineers & Scientists

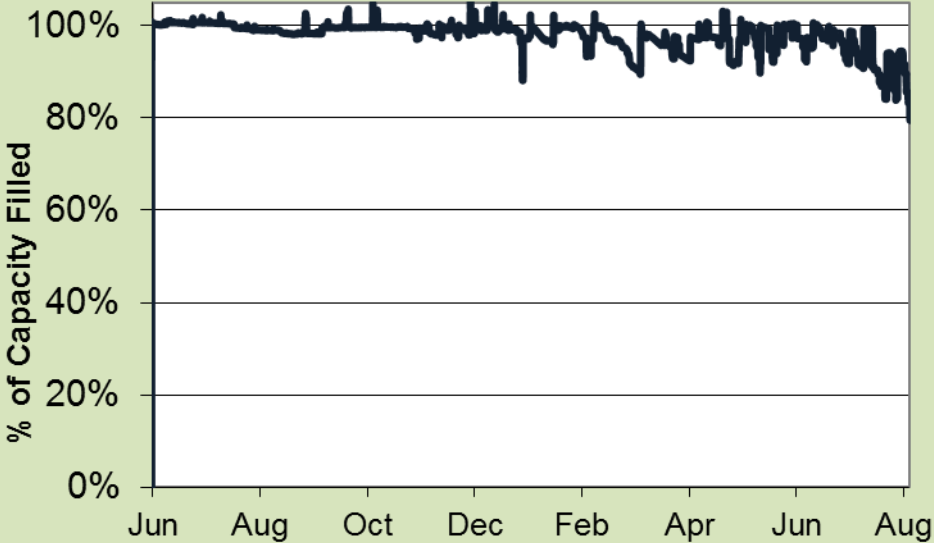


Key Green Infrastructure Barriers

- New and different approach
- Inherent variability
- Site specific nature
- Limited capacity for large storms
- Conflicts with existing regulations
- Distributed and different maintenance



New and Different Approach



Educational Tools



NYC Environmental Protection **planNYC**

Green Infrastructure: Blue Roof

Infraestructura Ecológica: Tejado azul

As part of the temporary Administration of the Bronx River Project, we're being refunded and asked to install trays on top of the concrete surface to slow the flow of stormwater that runs directly down the street.

Como parte del contrato de administración temporal del Proyecto del Río Bronx, nos estamos reembolsando por el trabajo del Centro de Construcción Comunitaria de la zona que instaló bandejas de almacenamiento de agua.

Total = 750 gallons
1 barrel (55 gallons)

Before, rain that fell on the roof would directly hit a drain and run down the New York City's street.

180 aluminum trays were installed to hold the rain and keep it from entering the roof drain. Ground is used to hold water from the New York City storm drains.

Now, stormwater stored in the trays evaporates into the air or flows slowly through the trays to filter out the sediment of the trays and filter the runoff water.

180 aluminum trays were installed on aluminum trays to hold water from the New York City storm drains. The trays are used to hold water from the New York City storm drains. The trays are used to hold water from the New York City storm drains.

Además de los techos, las que otra manera se puede reducir el agua?

For further information, please call 311 or go to www.nyc.gov/dep **Para más información llame al 311, o visite www.nyc.gov/dep**

NYC Environmental Protection **planNYC**

Green Infrastructure at the Bronx River Houses

Infraestructura Ecológica: Jardines con Sumideros

The landscaped areas around the community center might look like regular gardens, but they are actually part of the temporary Administration of the Bronx River Project. They are rain gardens that collect rain in an integrated collection system within stormwater collection, storage, and infiltration into the ground.

Las áreas verdes alrededor del Centro Comunitario de la zona pueden parecer jardines normales, pero en realidad son parte del contrato de administración temporal del Proyecto del Río Bronx. Estas áreas verdes están diseñadas para capturar y almacenar agua de lluvia en un sistema integrado de recolección, almacenamiento e infiltración de agua en el suelo.

Total = 18,500 gallons
1 barrel (55 gallons)

Before, rain would run off the concrete and down the street.

Now, these areas collect runoff from surrounding ground and store water until the water can be used for the plants.

These rain gardens are designed to collect rain and store it in the soil. The water is then slowly released into the ground, where it can infiltrate and recharge the aquifer.

Además de los techos, las que otra manera se puede reducir el agua?

For further information, please call 311 or go to www.nyc.gov/dep

NYC Environmental Protection **planNYC**

Green Infrastructure: Rain Gardens

Infraestructura Ecológica: Jardines con Sumideros

The landscaped areas around the community center might look like regular gardens, but they are actually part of the temporary Administration of the Bronx River Project. They are rain gardens that collect rain in an integrated collection system within stormwater collection, storage, and infiltration into the ground.

Las áreas verdes alrededor del Centro Comunitario de la zona pueden parecer jardines normales, pero en realidad son parte del contrato de administración temporal del Proyecto del Río Bronx. Estas áreas verdes están diseñadas para capturar y almacenar agua de lluvia en un sistema integrado de recolección, almacenamiento e infiltración de agua en el suelo.

Total = 18,500 gallons
1 barrel (55 gallons)

Before, rain would run off the concrete and down the street.

Now, these areas collect runoff from surrounding ground and store water until the water can be used for the plants.

These rain gardens are designed to collect rain and store it in the soil. The water is then slowly released into the ground, where it can infiltrate and recharge the aquifer.

Además de los techos, las que otra manera se puede reducir el agua?

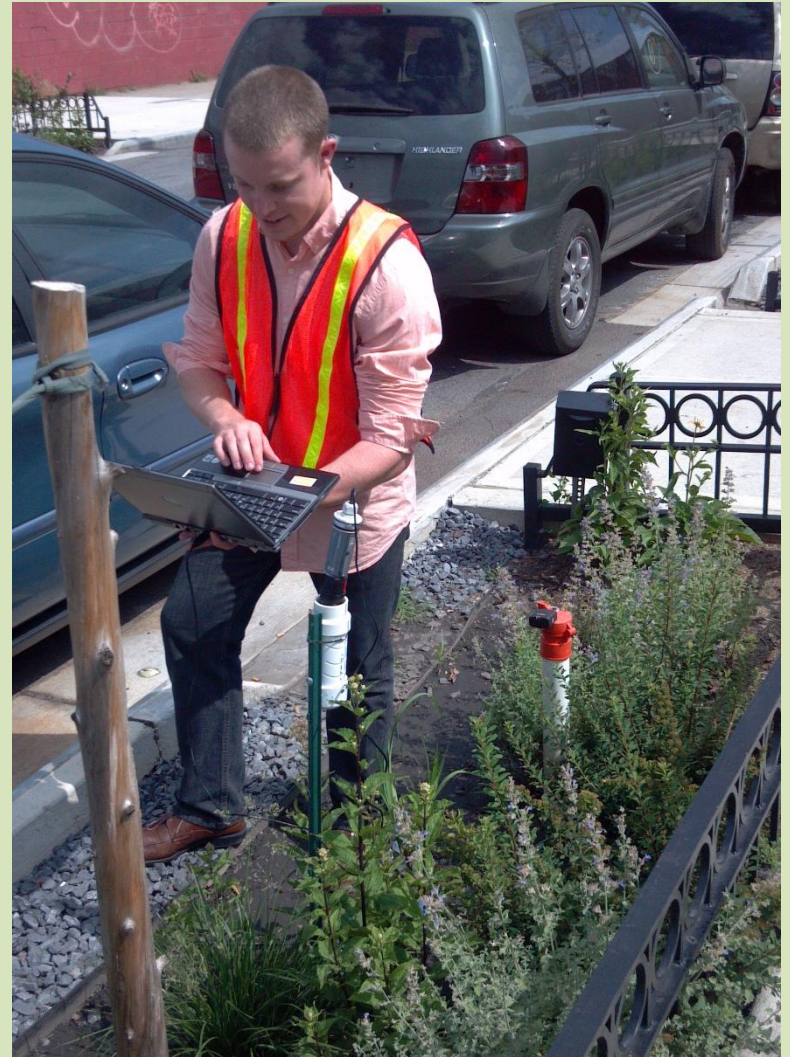
For further information, please call 311 or go to www.nyc.gov/dep **Para más información llame al 311, o visite www.nyc.gov/dep**

Inherent Variability

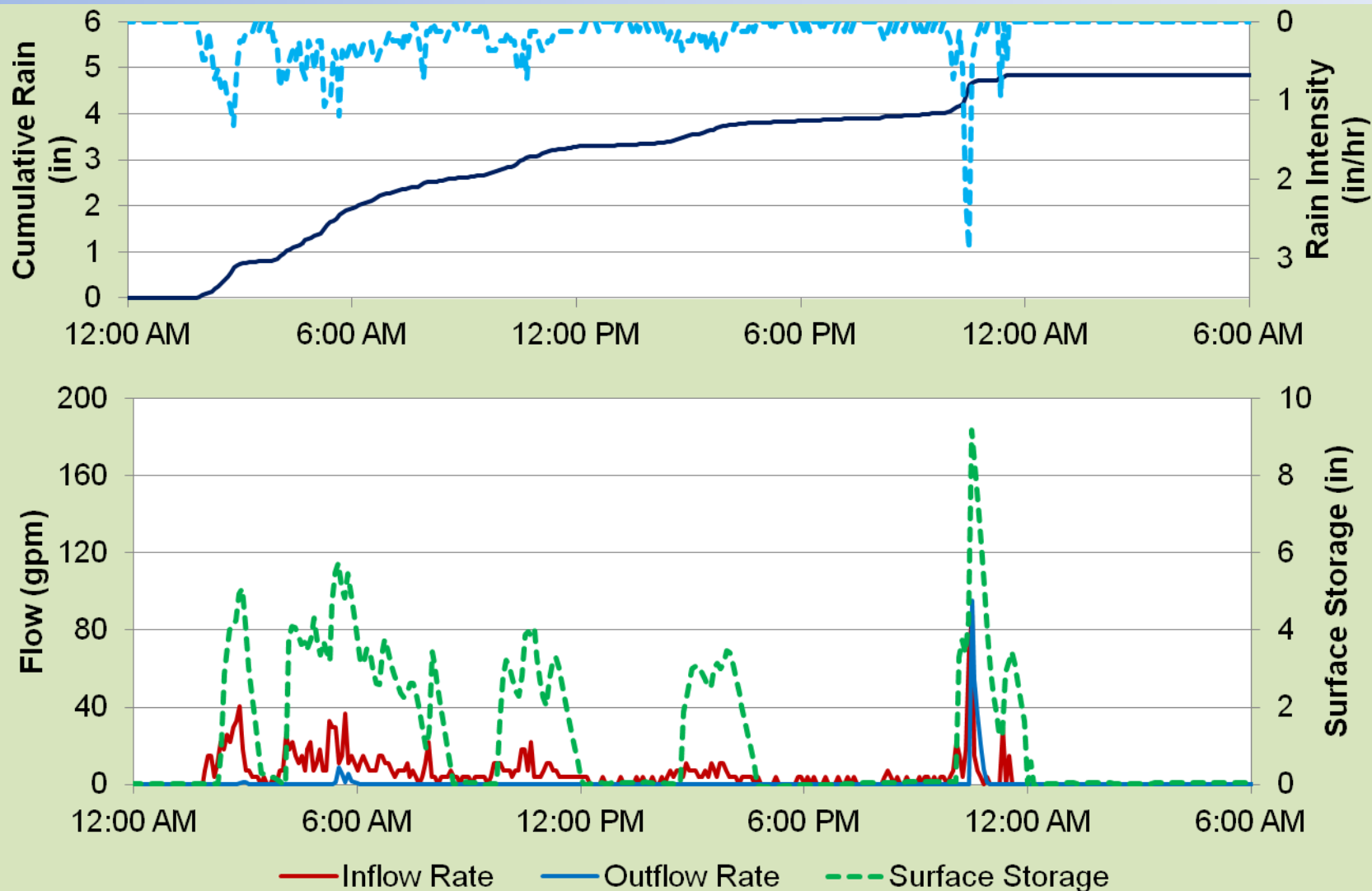
- Natural elements of green infrastructure can provide:
 - Multiple benefits
 - Resiliency
 - Uncertainty



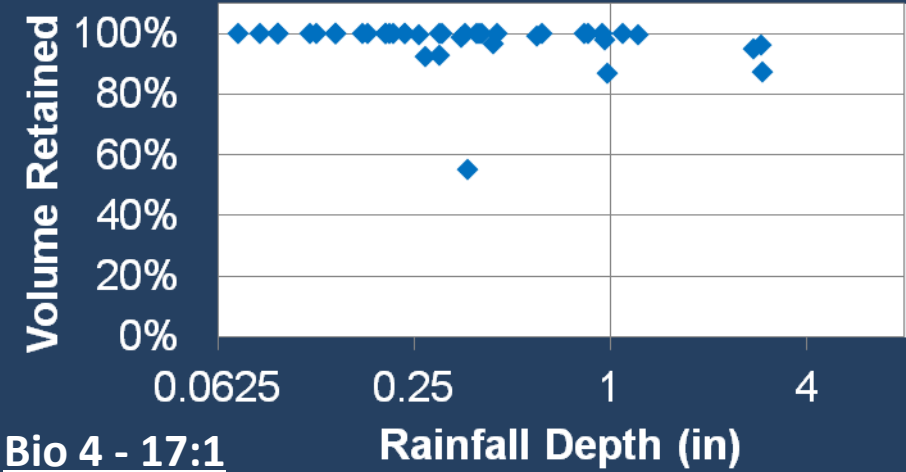
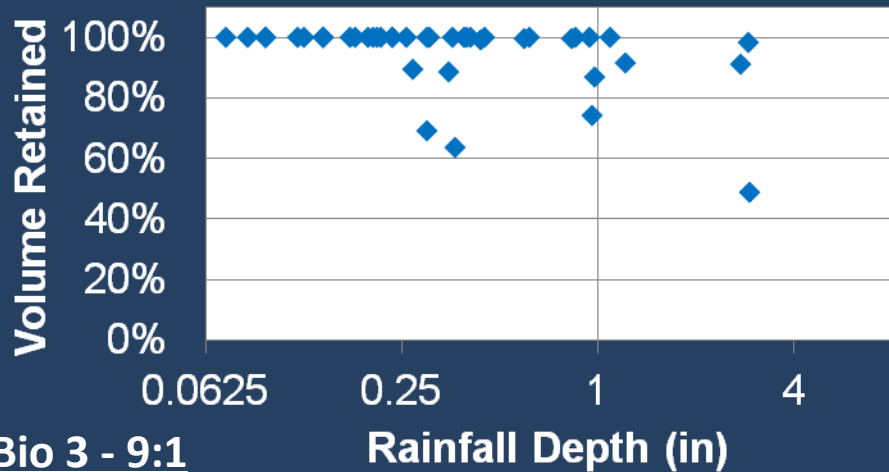
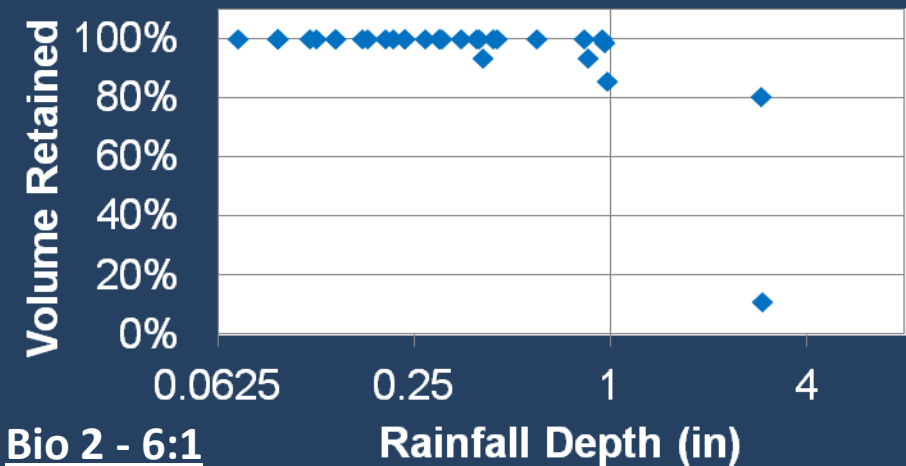
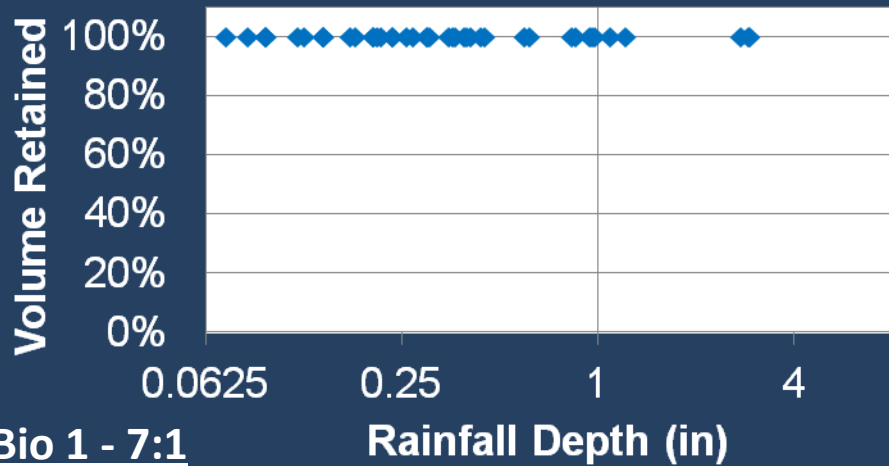
Monitoring On-the-Ground Controls



Bioretention: Example 4.8" Storm



Bioretention: Volume Retained



Site Specific Nature





Opportunity Identification



11:45 AM

Bioswale HR-26



Bioswale HR-26
4232 Baychester Ave., Bronx, NY

Site Assessment Details

Site Assessment Date: Mar. 25 11:35 AM

Sidewalk Width: <10 ft | 10-13 ft | >13 ft

Closest Driveway or Curb Cut: <10 ft | >10 ft

Existing Trees within 25 ft: NO

Overhanging Drip Line: NO

Closest Crosswalk or Pedestrian Ramp: <5 ft | >5 ft

Closest Fire Hydrant: <3 ft | >3 ft

Closest Bus Stop: <90 ft | >90 ft

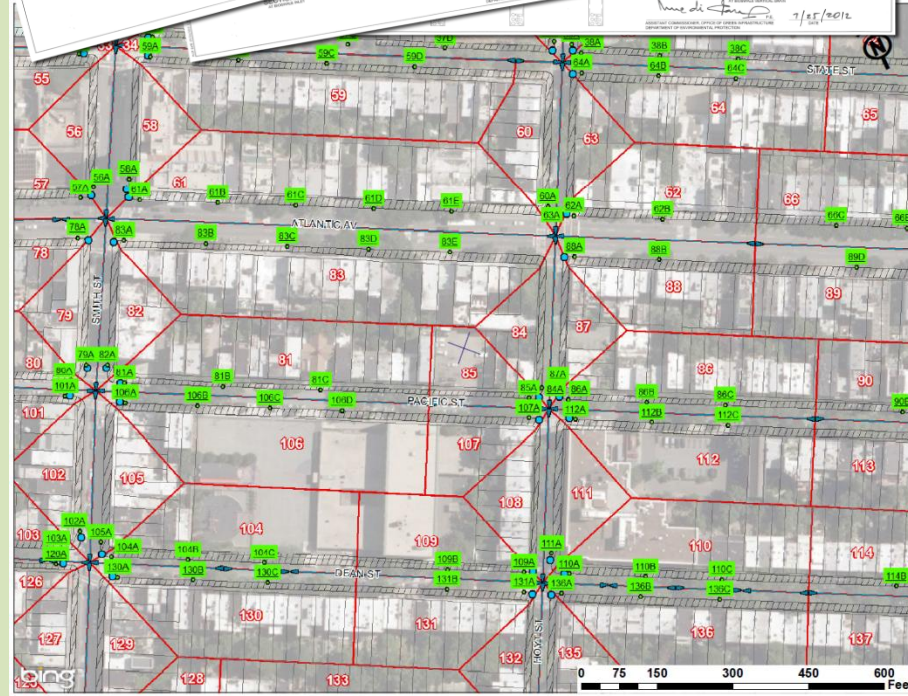
Closest Utility Pole: <4 ft | >4 ft

Evidence of Sidewalk Vaults: NO

Subsurface Utility Evidence: Electric: YES

Subsurface Utility Evidence: Gas: NO

Subsurface Utility Evidence: Communications: YES



Limited Capacity for Large Storms?



Sewershed Flow
Monitoring

Maintenance

- GI maintenance differs from grey due to:
 - Type of maintenance activities
 - Location of maintenance activities
- Important to consider maintenance during design
- Identify opportunities to consolidate maintenance with existing operations



Why Green Infrastructure?

- Focus on runoff retention
- Increased flexibility
- Opportunities for innovation
- Benefits beyond stormwater control
- Intrinsic resiliency
- Increased visibility
- Incremental implementation



Questions?

Matthew Jones, PE, PhD
mjones@hazenandsawyer.com
919-833-7152



HAZEN AND SAWYER
Environmental Engineers & Scientists