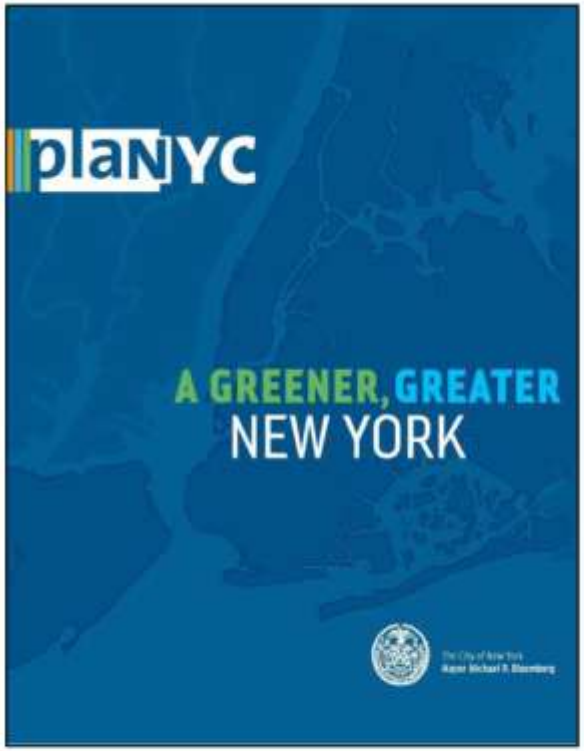
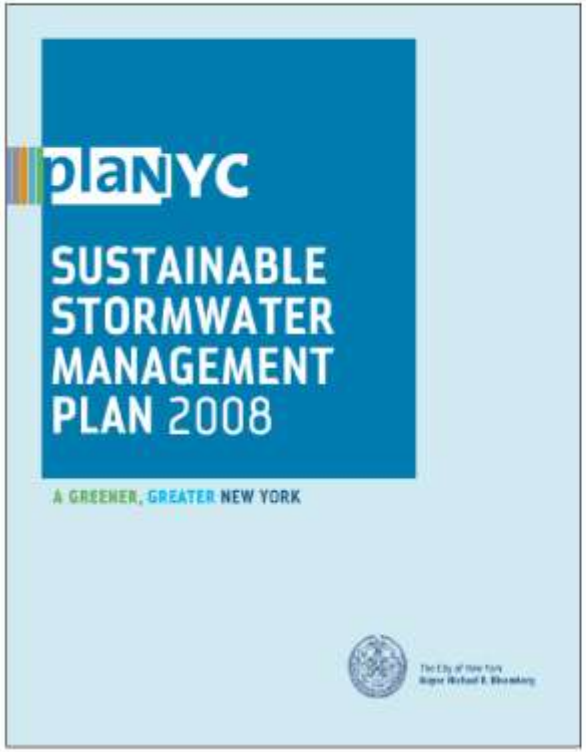
Environmental Protection

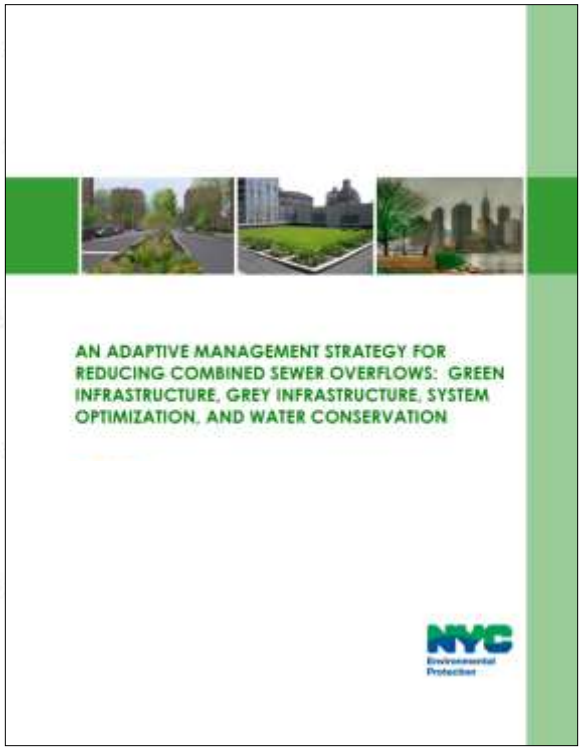
Green Infrastructure: Need and Opportunities to Green our Urban Landscape

June 28, 2010

Sustainability and stormwater



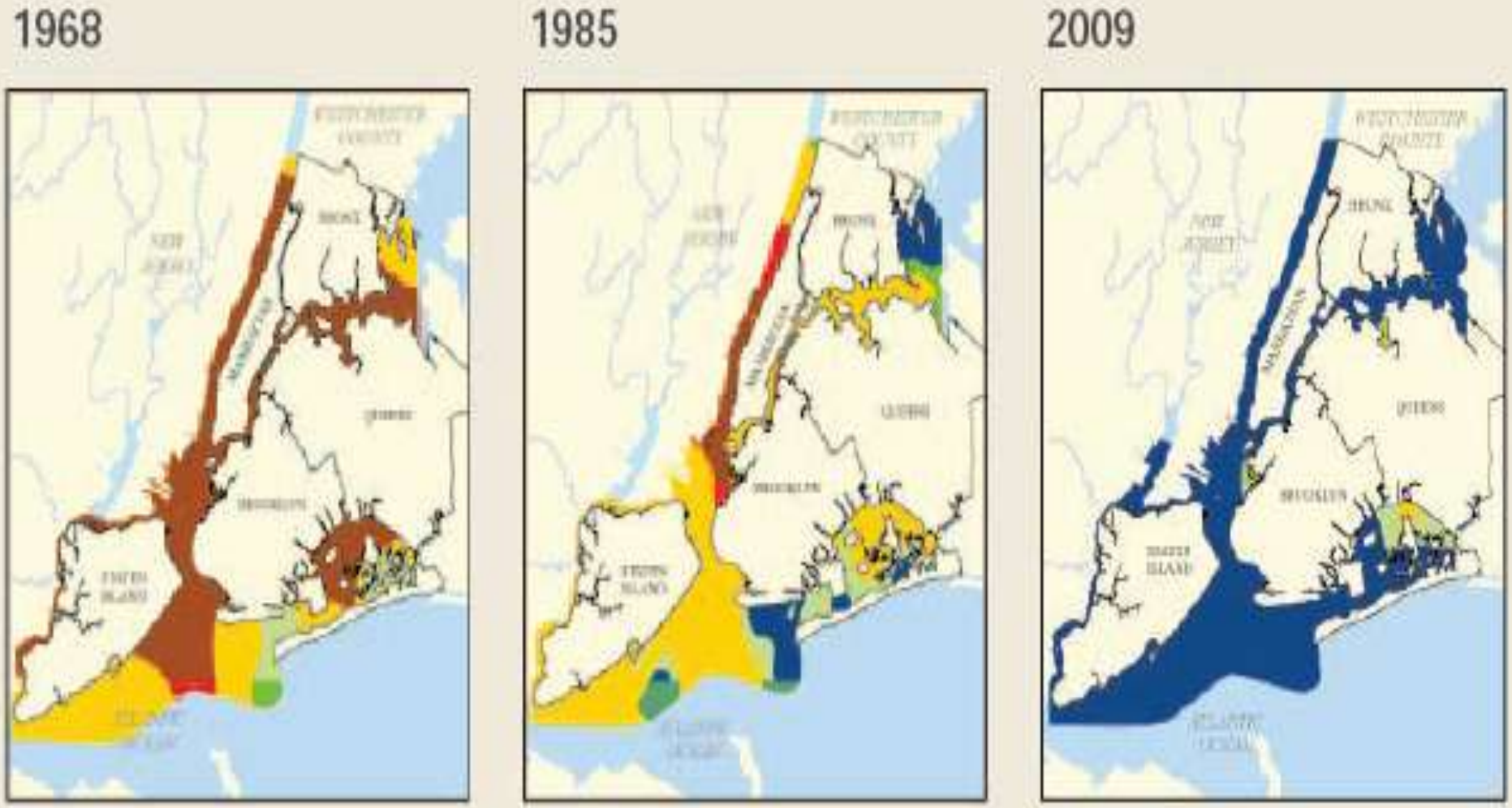




Agenda

- Overview of DEP's stormwater plan
- Breakout sessions
  - Group 1: Hutchinson River & Newtown Creek
  - Group 2: Bronx River & Flushing Bay
  - Group 3: Westchester Creek & Gowanus Canal
- Questions and answers
- Next steps

Investments have reduced fecal coliform levels



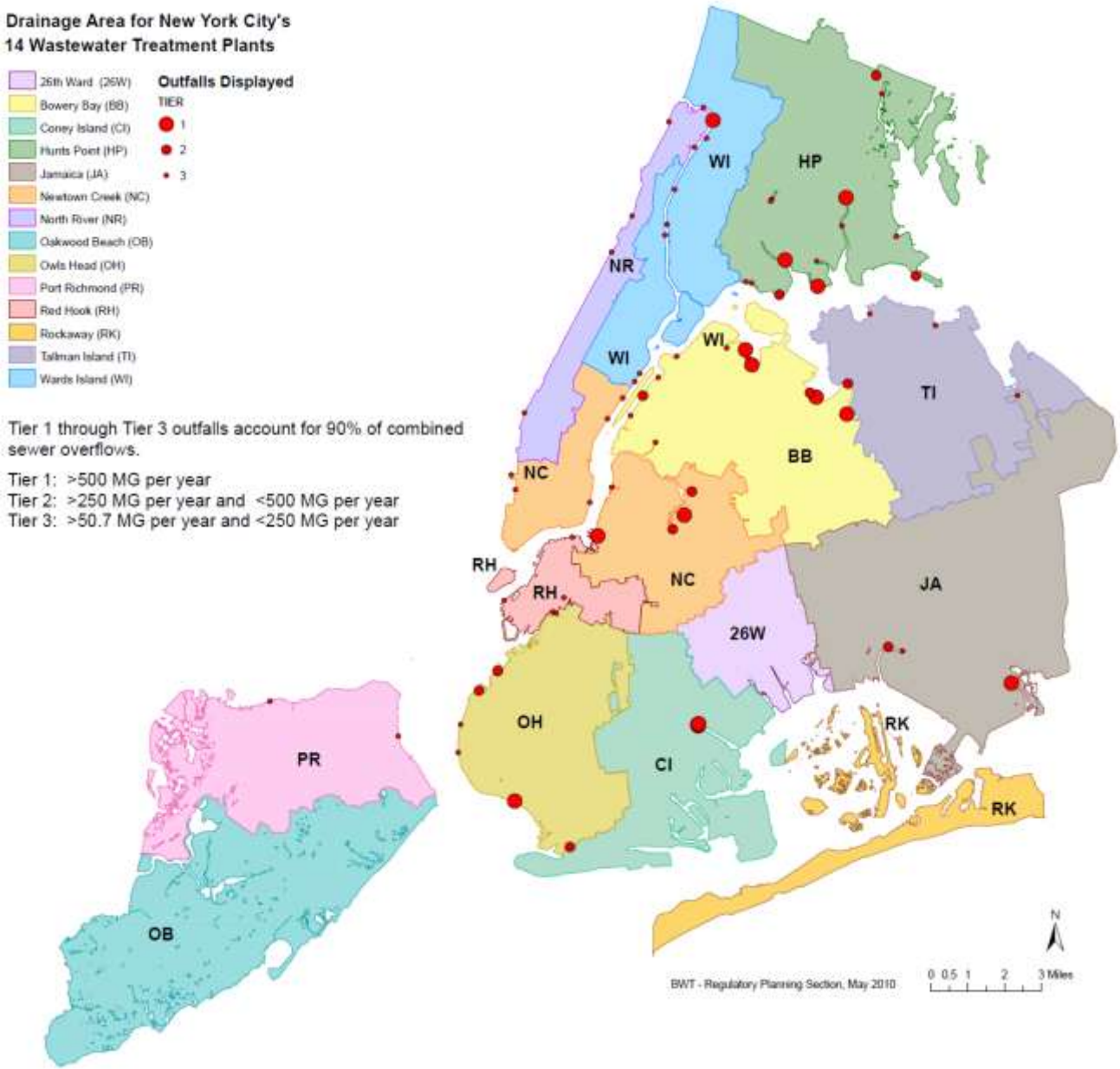
More than 2000 cells

201 to 2000 cells

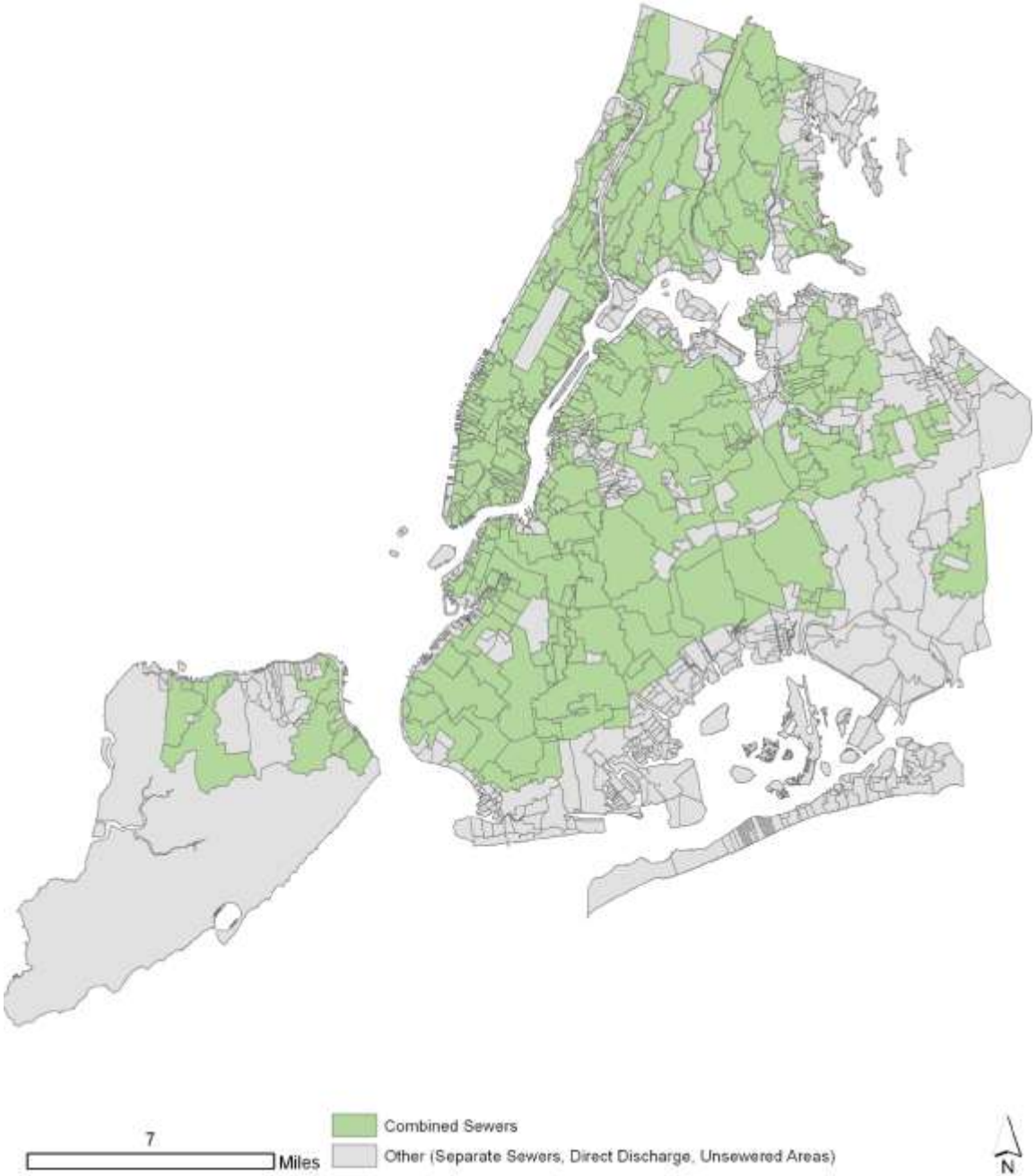
101 to 200 cells

Less than 100 cells

Combined sewer areas and outfalls



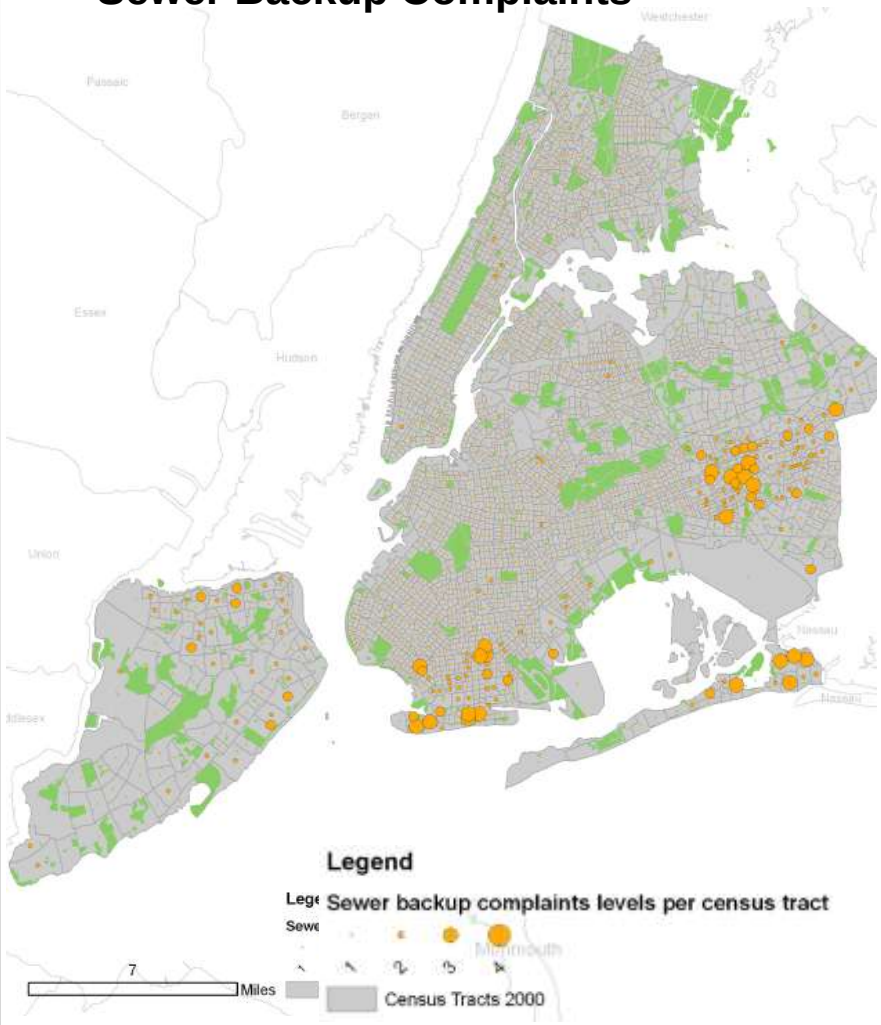
Additional controls needed for combined sewer areas



and to manage stormwater in separated sewer areas

Flooding Complaints

Sewer Backup Complaints



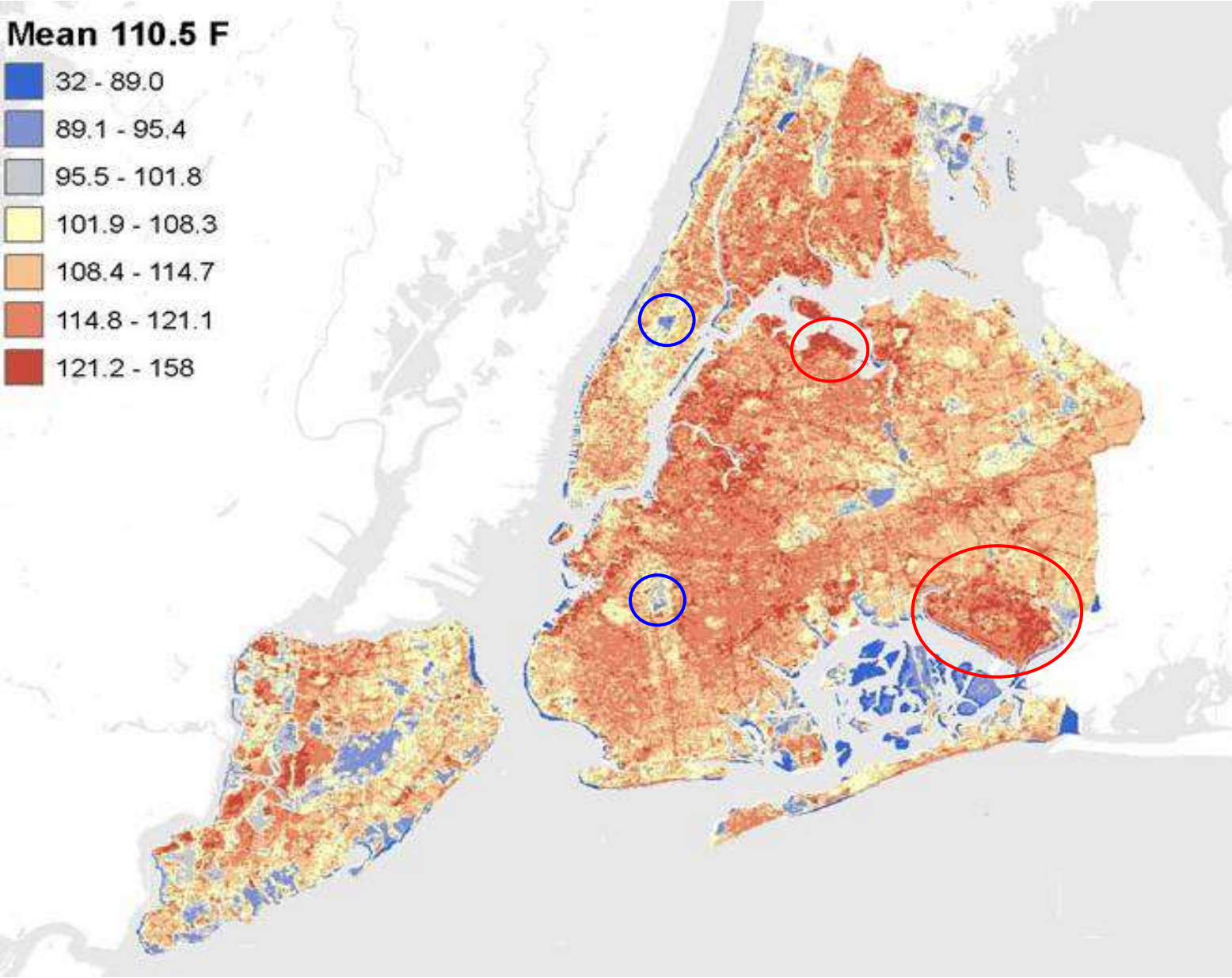
Source: NYC Department of Environmental Protection

Climate change will cause more stormwater

	BASELINE 1971-2000	2020s	2050s	2080s
Air Temperature[2]	55°F	+ 1.5 to 3°F	+ 3 to 5°F	+ 4 to 7.5°F
Precipitation[2]	46.5 in	+ 0 to 5%	+ 0 to 105%	+ 5 to 10%
Sea Level Rise[2,3]	NA	+ 2 to 5 in	+ 7 to 12 in	+ 12 to 23 in
Rapid Ice-Melt Sea Level Rise[4]	NA	~ 5 to 10 in	~ 19 to 29 in	~ 41 to 55 in

Source: New York City Panel on Climate Change

and will also create more need to cool urban areas



We can treat water as a waste

or as a resource

Most opportunities are in buildings and roads

		All City Land		Impervious Surfaces	
Sector	Land Use Categories	% of Total Land Area	Group % of Total Land	Impervious Ratio	% of Impervious Area
Buildings and Lots	One Family Dwellings	14%	48%	62%	51%
	Two-Three Family	12%		79%	
	Multi-Family Buildings	8%		81%	
	Mixed Residential & Commercial Buildings	2%		94%	
	Residential Institutions	1%		55%	
	Hotels	0%		92%	
	Hospitals And Health	1%		54%	
	Public Facilities & Institutions	2%		69%	
	Educational Structures	2%		72%	
	Parking Facilities	1%		88%	
	Light Industrial & Manufacturing Buildings	2%		95%	
	Heavy Industrial & Manufacturing Buildings	1%		83%	
	Stores	2%		94%	
	Office Buildings	1%		92%	
Right of Way	Roadbed	17%	24%	100%	33%
	Sidewalk	6%		100%	
	Median	0.5%		100%	
Open Space and Vacant Land	Open Space & Outdoor Recreation	16%	21%	30%	9%
	Vacant Land	5%		28%	
Other	Transportation & Utility	7%	7%	66%	7%
	Miscellaneous	1%		78%	
	Total	**100%**	**100%**	**71%**	**100%**

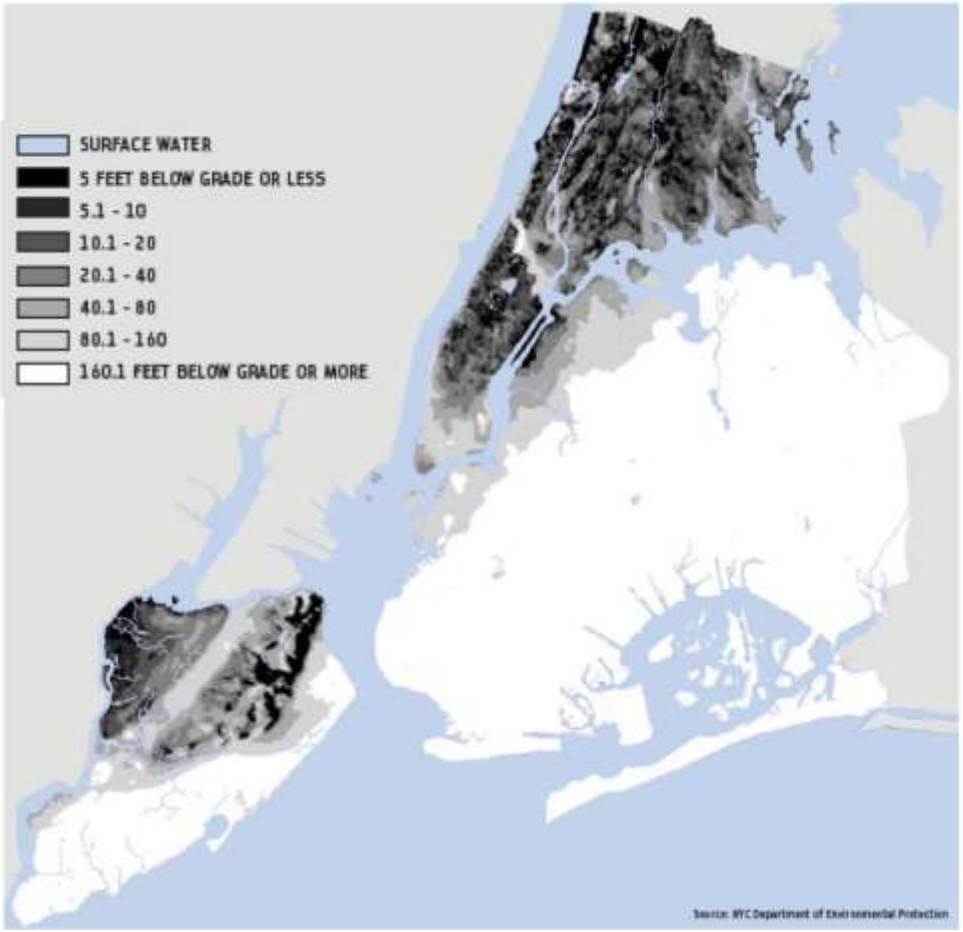
Stormwater Best Management Pilots

Built and planted

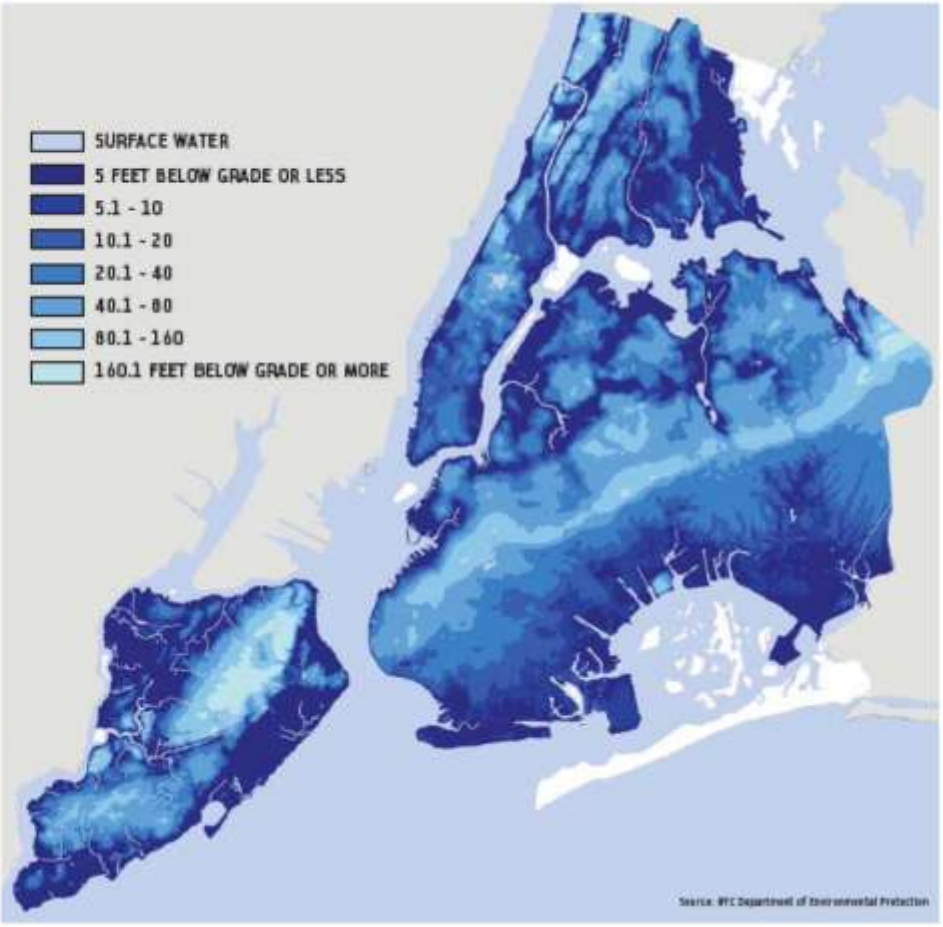
Integrated into the urban landscape

Constraints on infiltration strategies

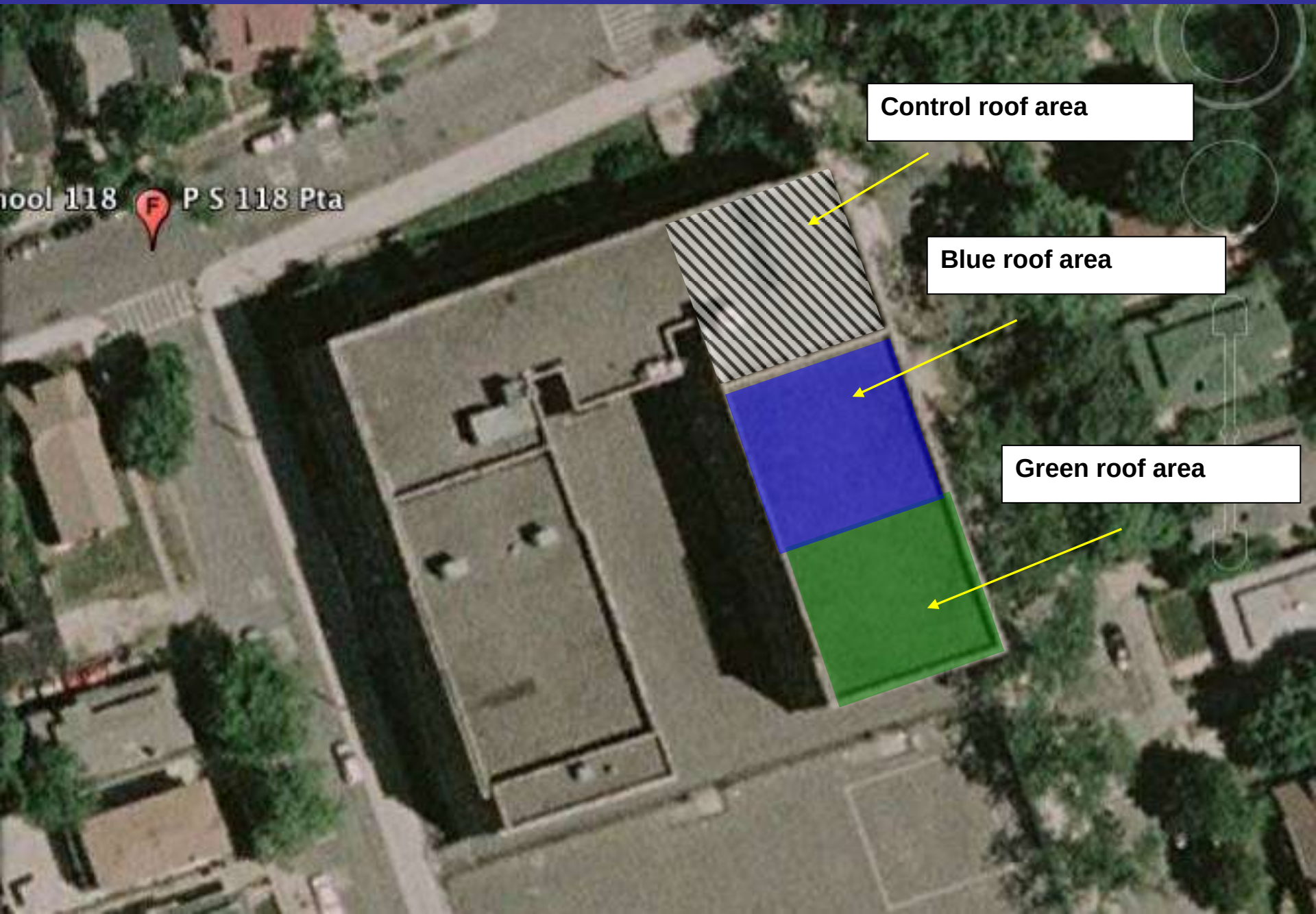
Depth to Bedrock



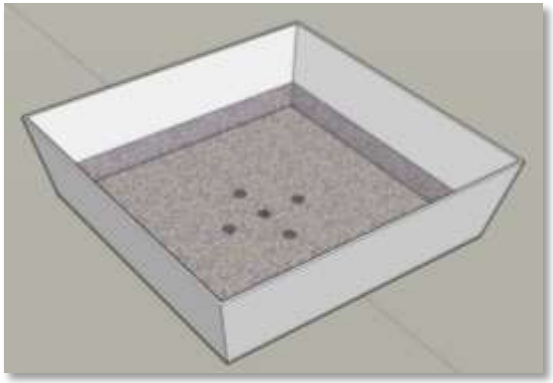
Depth to Groundwater



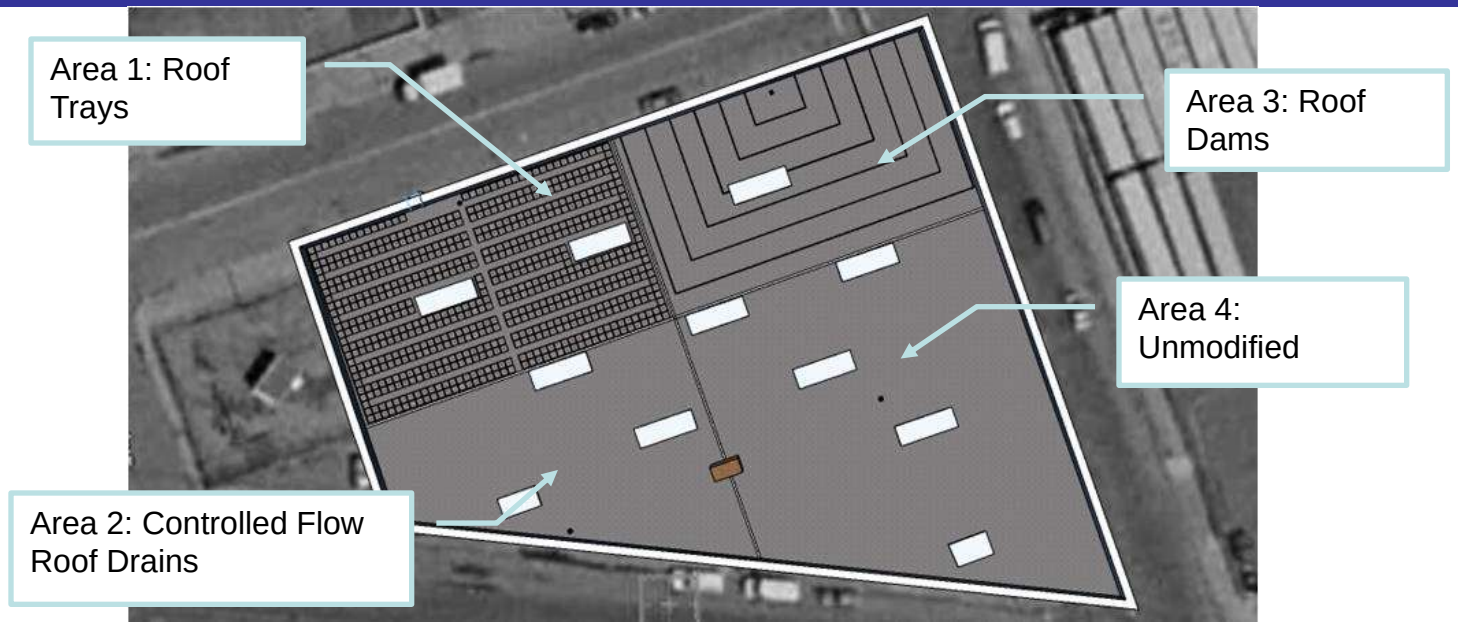
Rooftop Pilot 1: side by side comparison

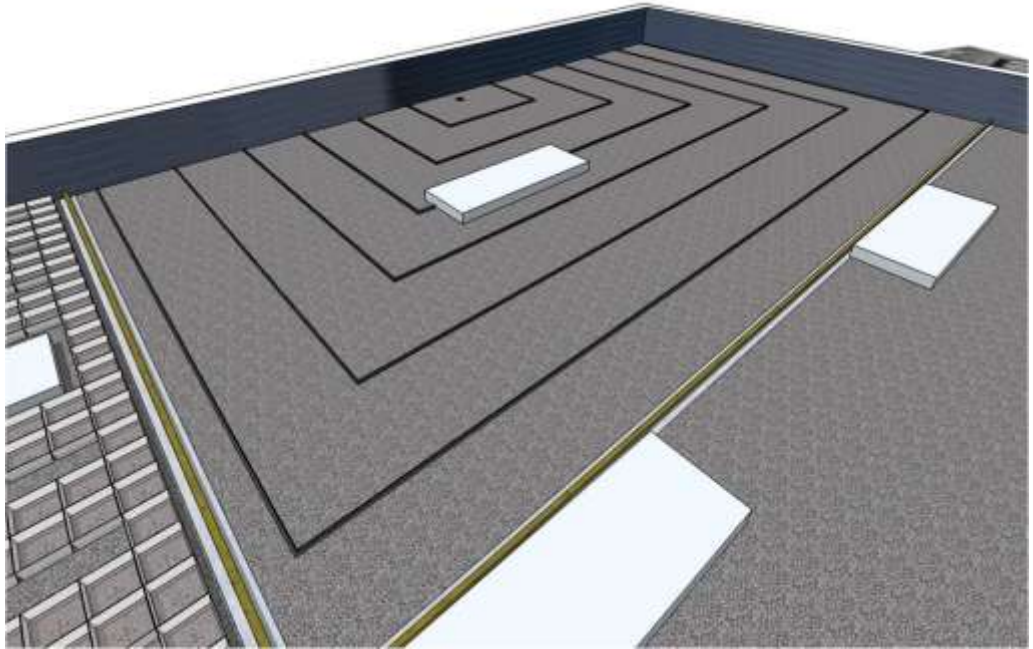


Rooftop Pilot 2: modular tray detention system



Rooftop Pilot 3: detention strategies



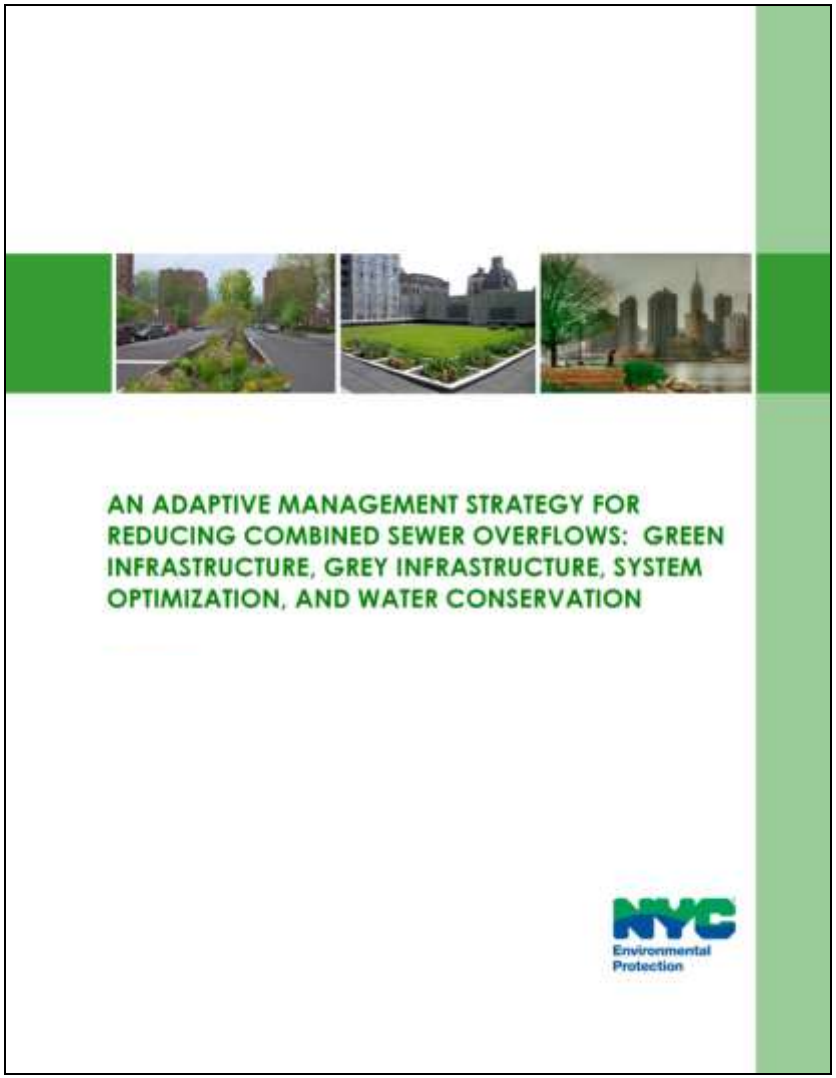


- 2” high fiberglass or aluminum “L” shaped material
- Spaced to maximize ponding across the drainage area
- Orifices drilled in dams to reduce flow to 2.5 gpm/inch of ponding
- Place gravel around orifices to protect from clogging

Source controls on new development

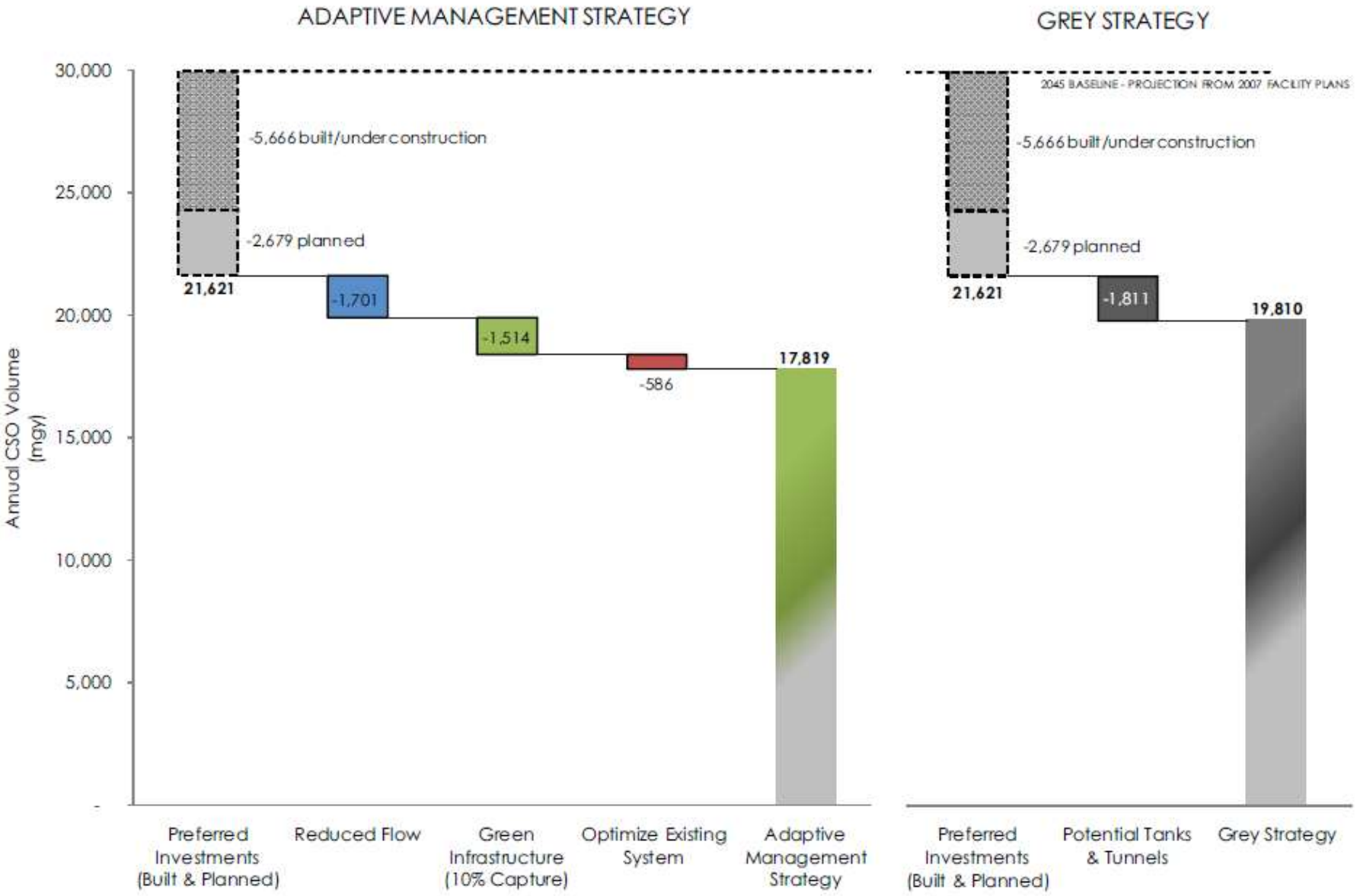
- Performance standard to require a controlled release from new developments through detention or infiltration technologies:
  - Blue roofs
  - Green roofs
  - Detention tanks
  - Gravel beds
  - Storm chambers
  - Perforated pipes

DEP's proposed Adaptive Management Strategy

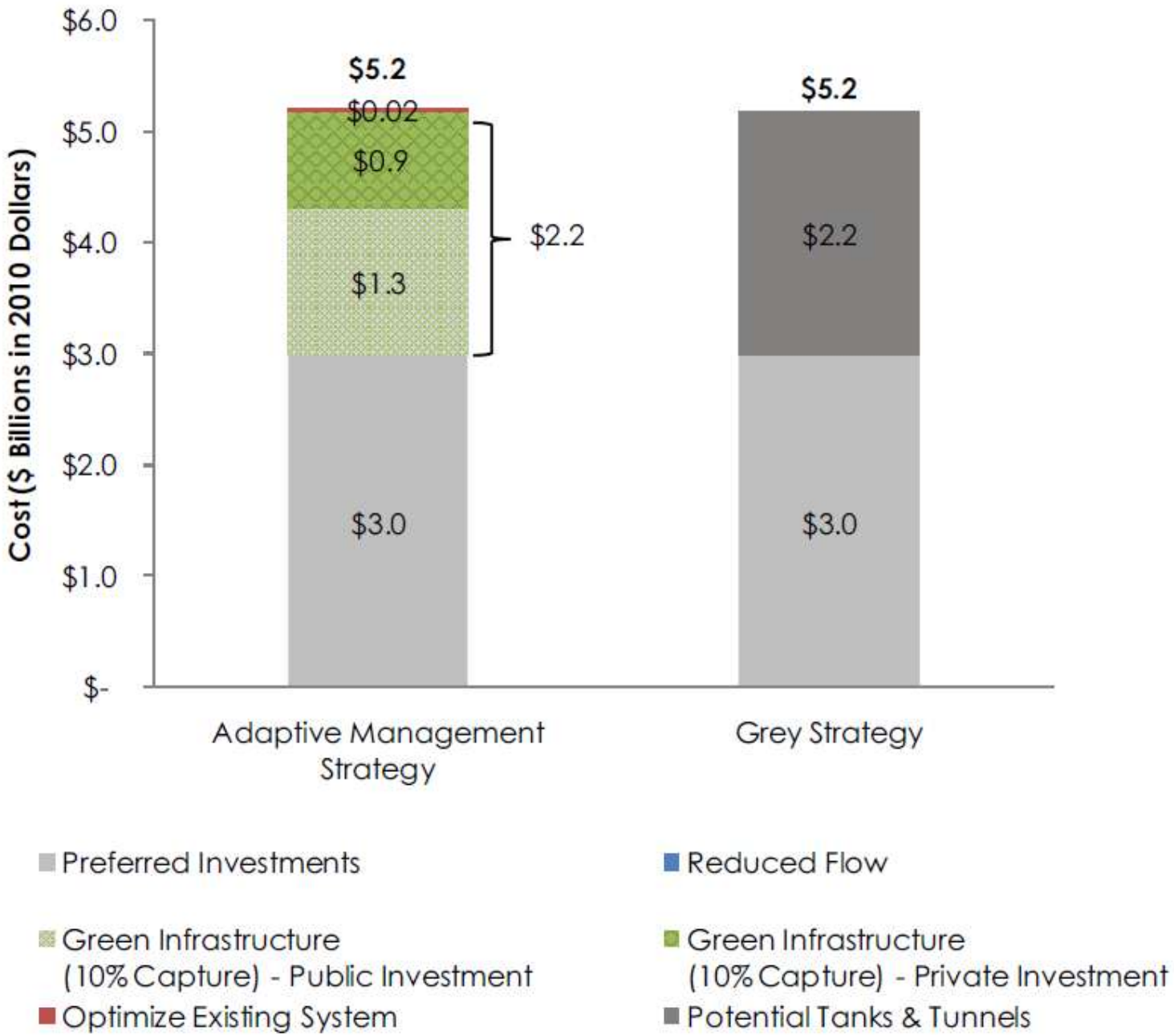


1. Build select grey infrastructure
2. Optimize the existing wastewater system
3. **Control runoff from 10% of impervious surfaces through green infrastructure and other source controls**
4. Institutionalize adaptive management, model impacts, measure CSOs, and monitor water quality
5. Engage and enlist stakeholders

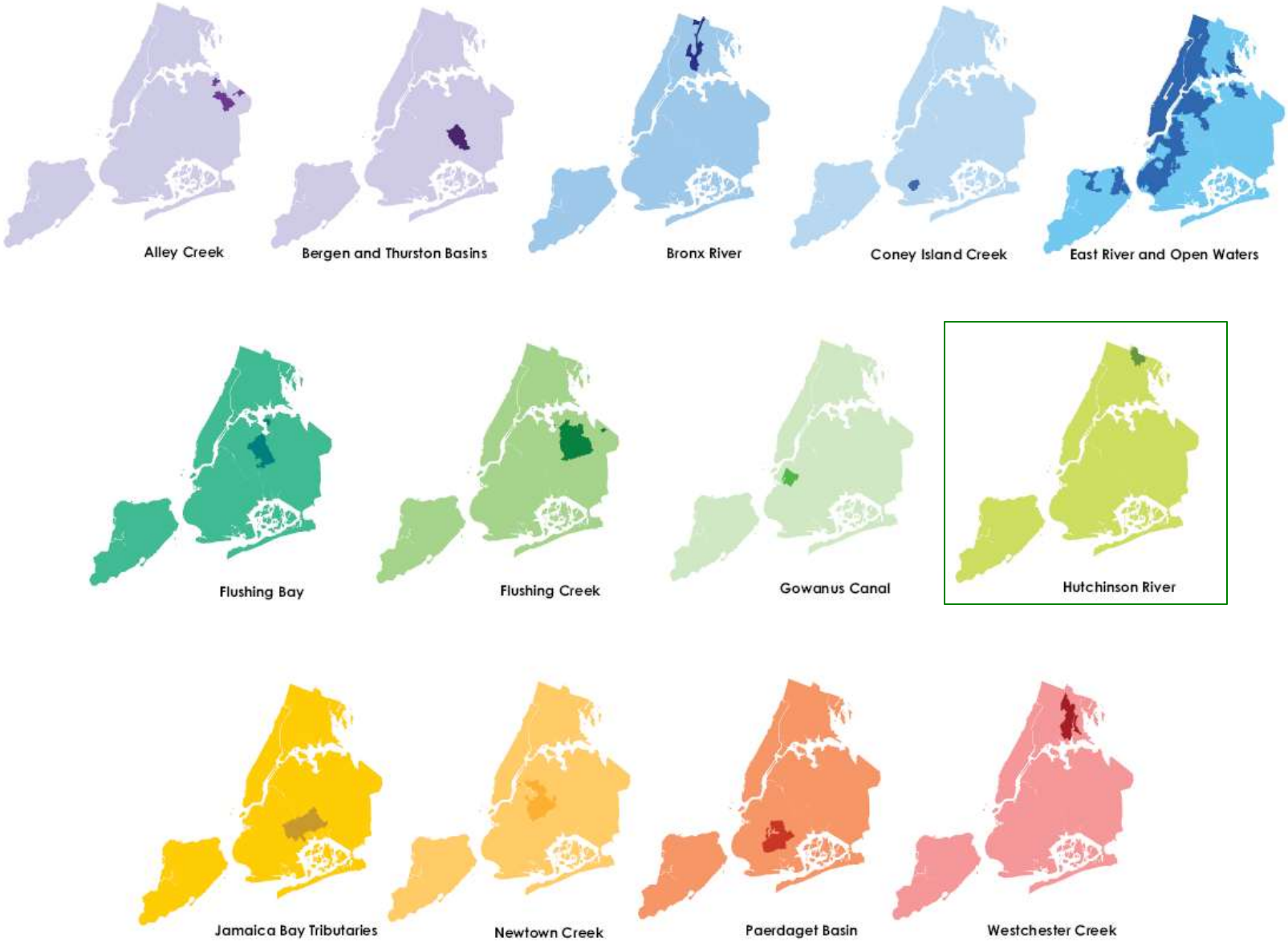
Performance comparison



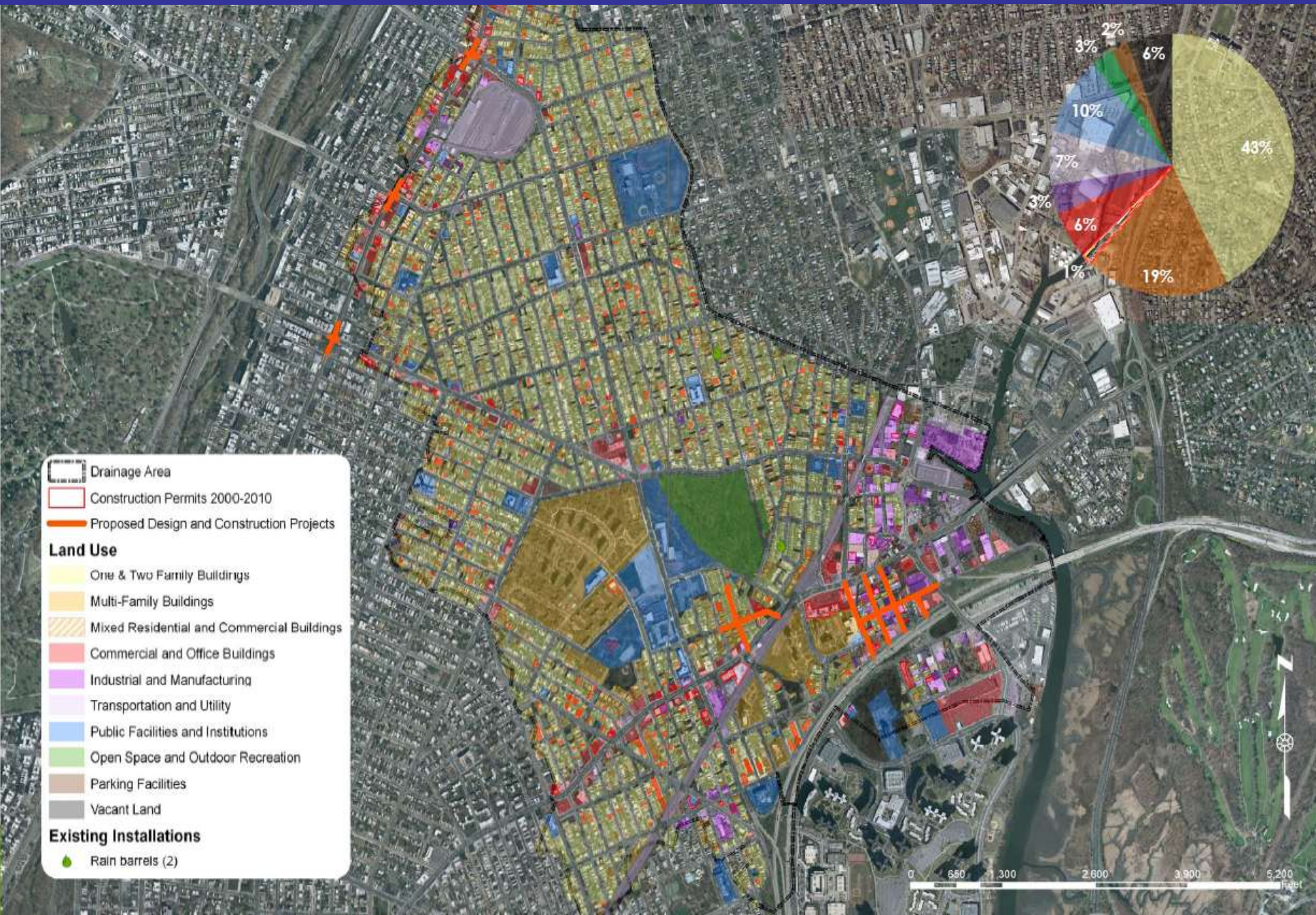
Cost comparison



Watershed specific opportunities



Hutchinson River



Breakout Groups

Group 1: Hutchinson River & Newtown Creek

Group 2: Bronx River & Flushing Bay

Group 3: Westchester Creek & Gowanus Canal

Next steps

- Send additional ideas to:

  sustainability@dep.nyc.gov

- Publish final plan
- Share initial plan with DEC and EPA
- Reconvene in the Fall
- Begin implementation
- Refine modeling

Next steps

For more information, go to:

www.nyc.gov/dep

Under *Hot Topics* on the right, click:

“Managing Combined Sewer Overflows”