Environmental Protection

Michael Bloomberg, Mayor
Cas Holloway, Commissioner

The NYC Watershed Model: Prospects for Success in the City

Watershed Science and Technical Conference
West Point
September 15, 2010

Overview

1. Aspects of the NYC Watershed Model
   - Partnership (Regulators and Stakeholders)
   - Flexibility
   - Predictability
   - Track Record of Engagement, Trust & Success

2. Bringing the Watershed Model to the City
   - Current Framework
   - Biggest Challenges: Nutrients and Stormwater
   - Case Study—Stormwater Management

Watershed Protection of Source Waters

- 2,000 square mile watershed
- Serves 9 million people (50% of State)
- 580 billion gallon capacity
- ~ 1 billion gallons/day
- Farms and forests are predominant land uses
- Partnerships endorsed in 10-year filtration avoidance determination (2007 to 2017)
- 110,000+ acres acquired since 1997
- $1.5 billion committed to date
- In 2007 DEP allocated an additional $241 million for land acquisition, $175 Million for other FAD programs (over 5 years)

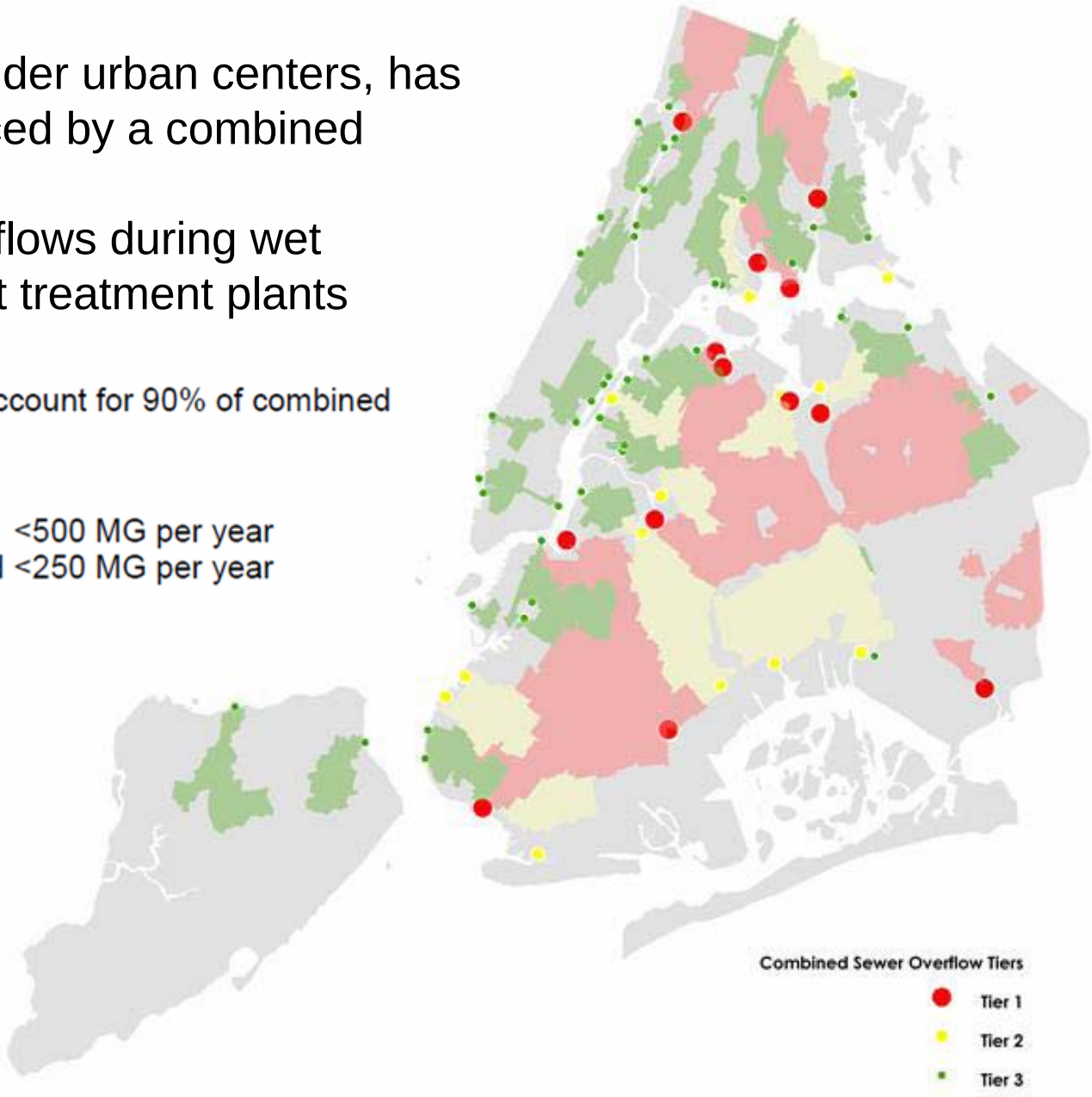
Stormwater and the Ultra-Urban Environment

Stormwater and Combined Sewer Systems

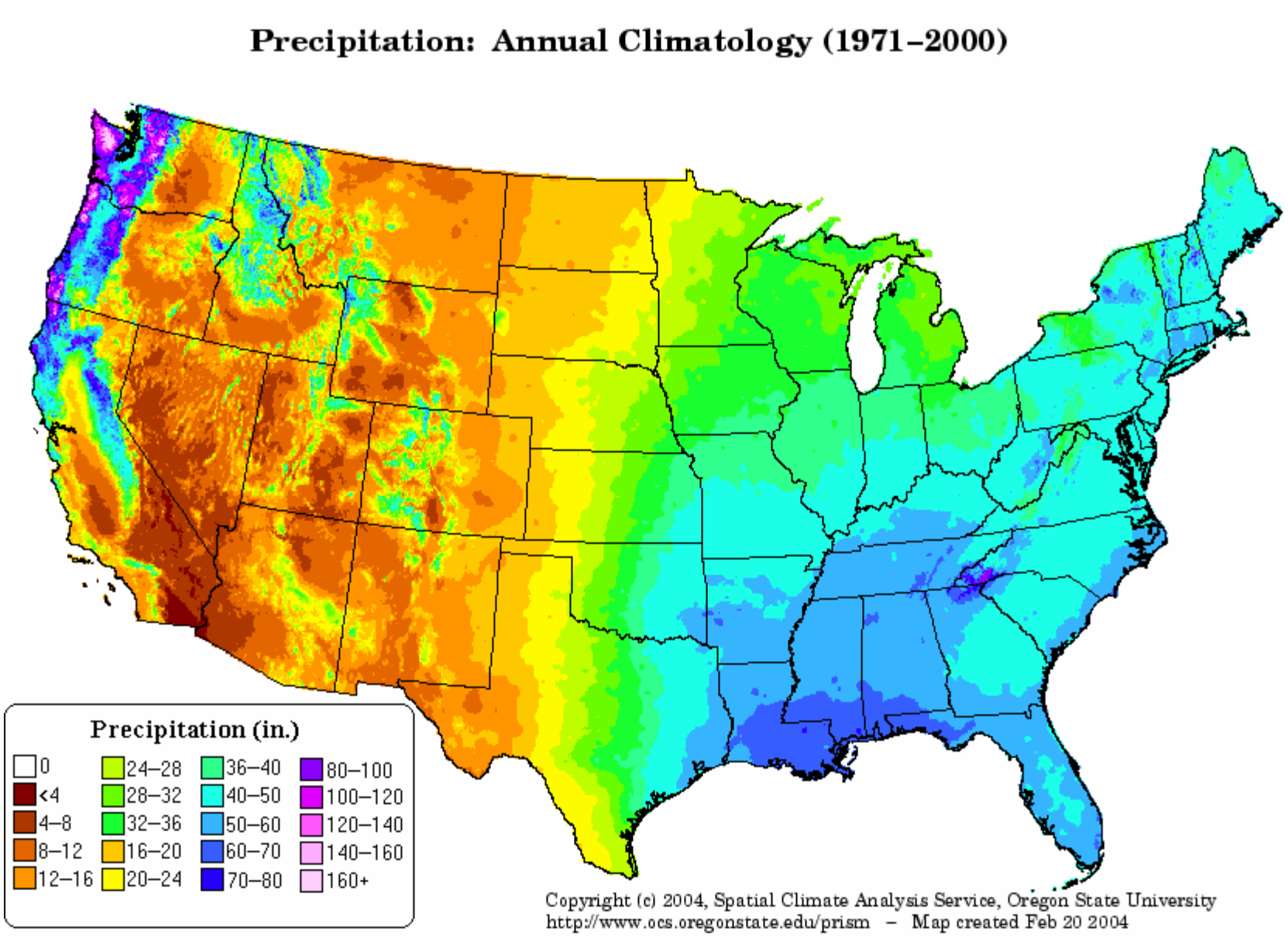
- NYC, like other older urban centers, has large areas serviced by a combined sewer system.
- This system overflows during wet weather to protect treatment plants

Tier 1 through Tier 3 outfalls account for 90% of combined sewer overflows.

Tier 1: >500 MG per year
Tier 2: >250 MG per year and <500 MG per year
Tier 3: >50.7 MG per year and <250 MG per year



A Superabundance of Water in the Northeast



NYC Impacts of Climate Change

	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

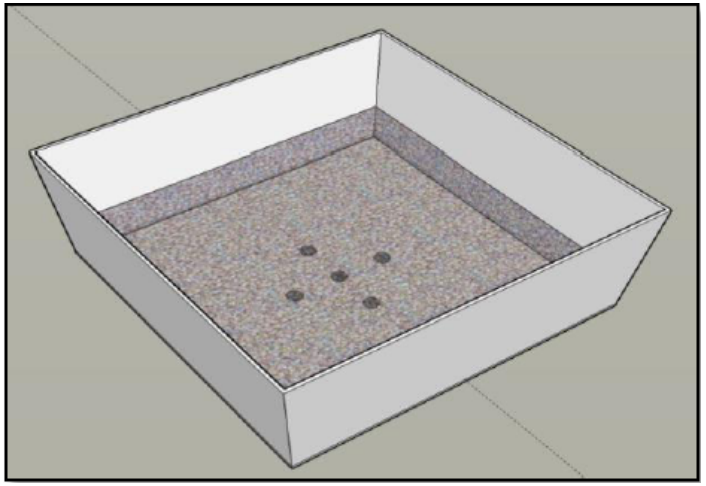
Source: New York City Panel on Climate Change

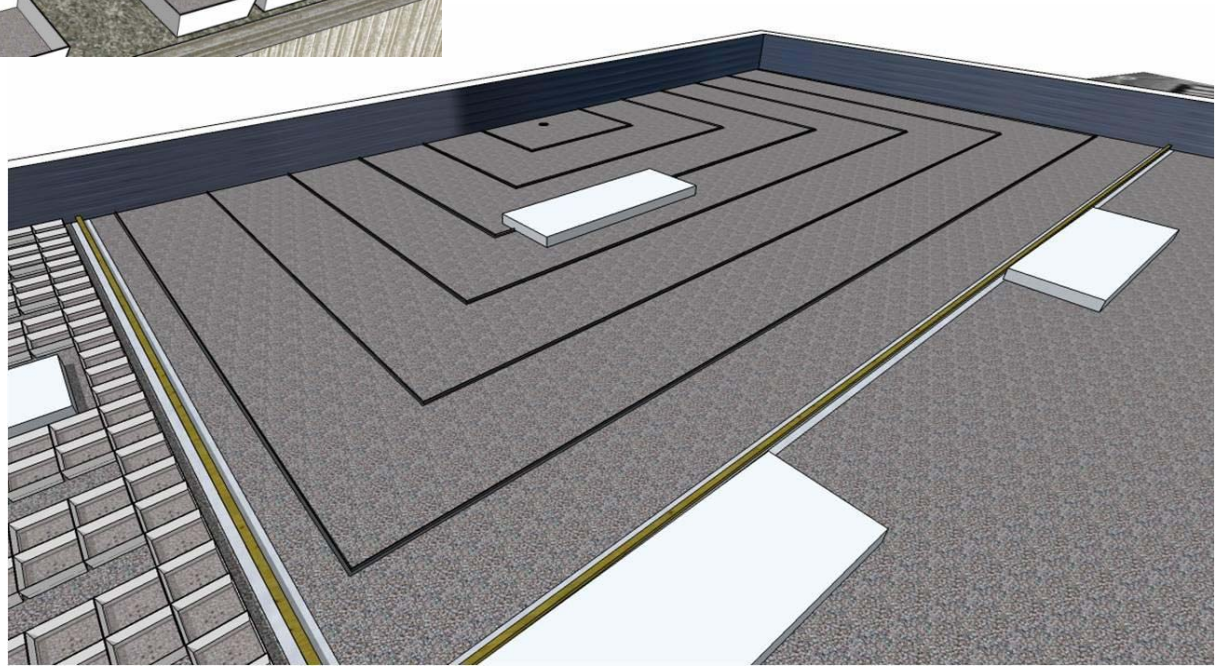
Stormwater as a Waste Product: CSO Detention Facility

Stormwater as a Resource: Staten Island Bluebelts

NYC Environmental Protection

Innovative Rooftop Detention Technology





Green Infrastructure for Streets

Bluebelts, Staten Island

Enhanced Tree Pit, Brooklyn

Streetside Bioswale, Queens

Porous Pavement, Paerdegat CSO Facility

Green Infrastructure for Rooftops

Rain Barrels, Brooklyn and Queens

Green Roof, Paerdegat CSO Facility

Green Roof, Bronx County Courthouse

Blue Roof

Greenstreets and Parks

ARRA-funded Greenstreet
Seagirt Avenue, Rockaways, Queens

Printer's Park
Bronx

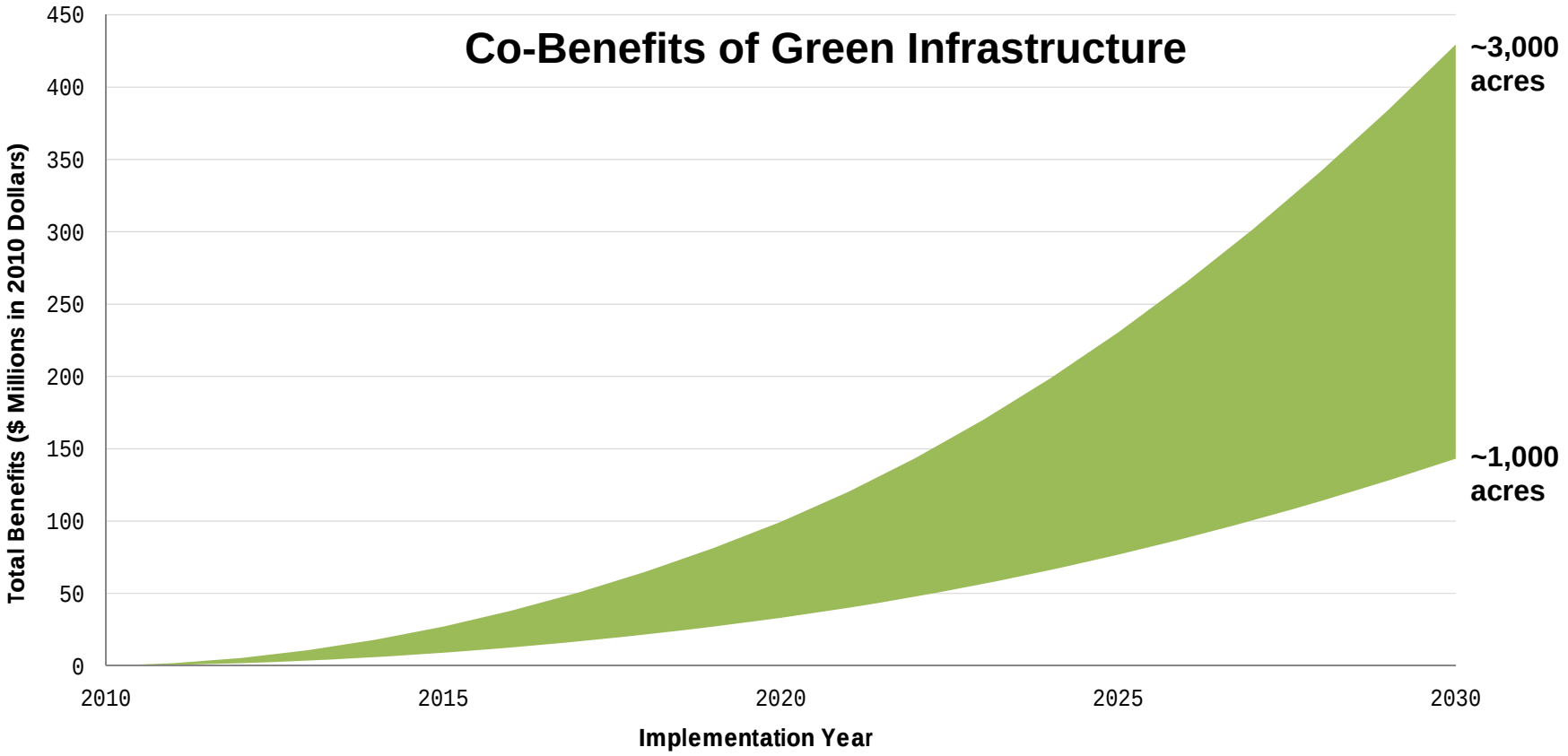
NYC's Hybrid Approach

- Build cost-effective grey infrastructure
- Defer expensive grey infrastructure (tunnels and tanks) and instead build green infrastructure to prevent stormwater from entering the sewer system by capturing it at the source
- NYC currently has over 30 green infrastructure pilots under way or planned, led by the Department of Environmental Protection in collaboration with the Departments of Parks, Housing, Transportation, and Education

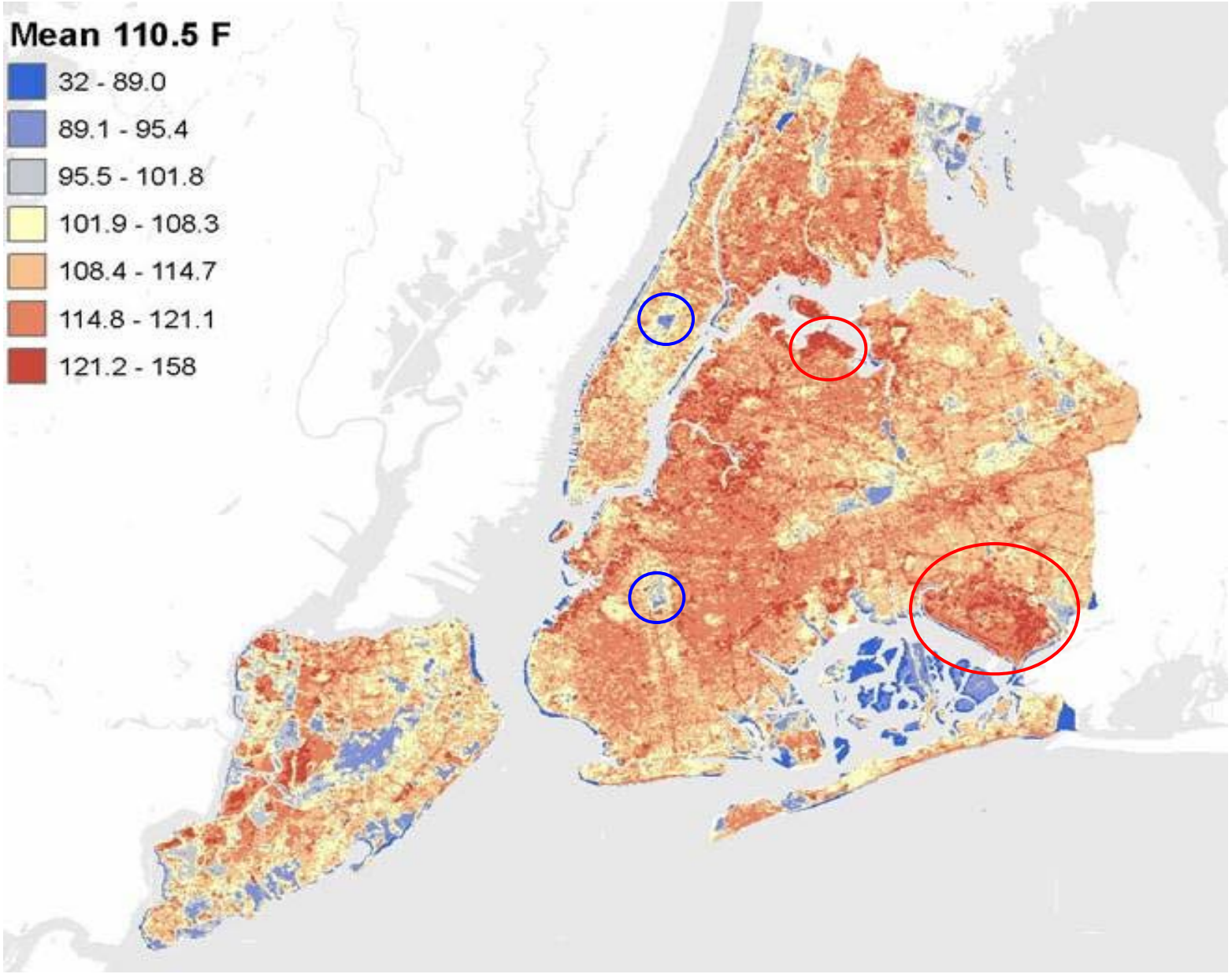
Opportunity	Stormwater Techniques	Partners
Rooftops	Rain barrels; blue roof/green roof comparative study; rooftop detention techniques	Citizen groups, NYCHA, DOE
Roads	Greenstreets; enhanced tree pits; swales	DOT, DDC, DPR
Parking Lots	Bioinfiltration; porous pavement; wetlands; subsurface detention	DOT, MTA, NYCHA
Sidewalks	Porous pavement; porous pavers	DOT
Parks	Bioinfiltration cells; underground storage chambers	DPR, NYSDOT

Social Co-Benefits

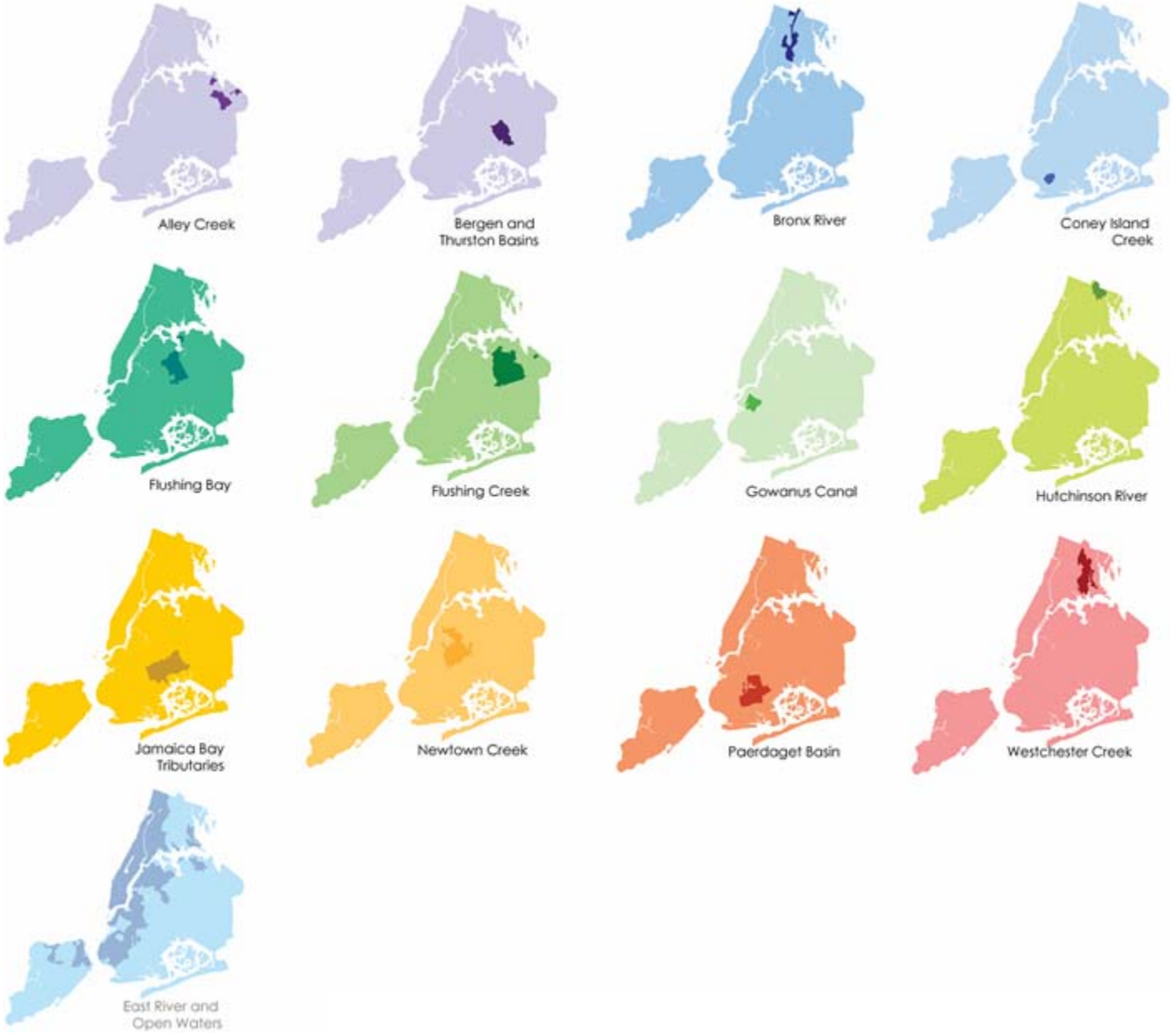
Annual benefits of green infrastructure per acre	
Reduced energy demand:	$5,513
Reduced carbon dioxide:	$117
Improved air quality:	$759
Increased property value:	$4,725



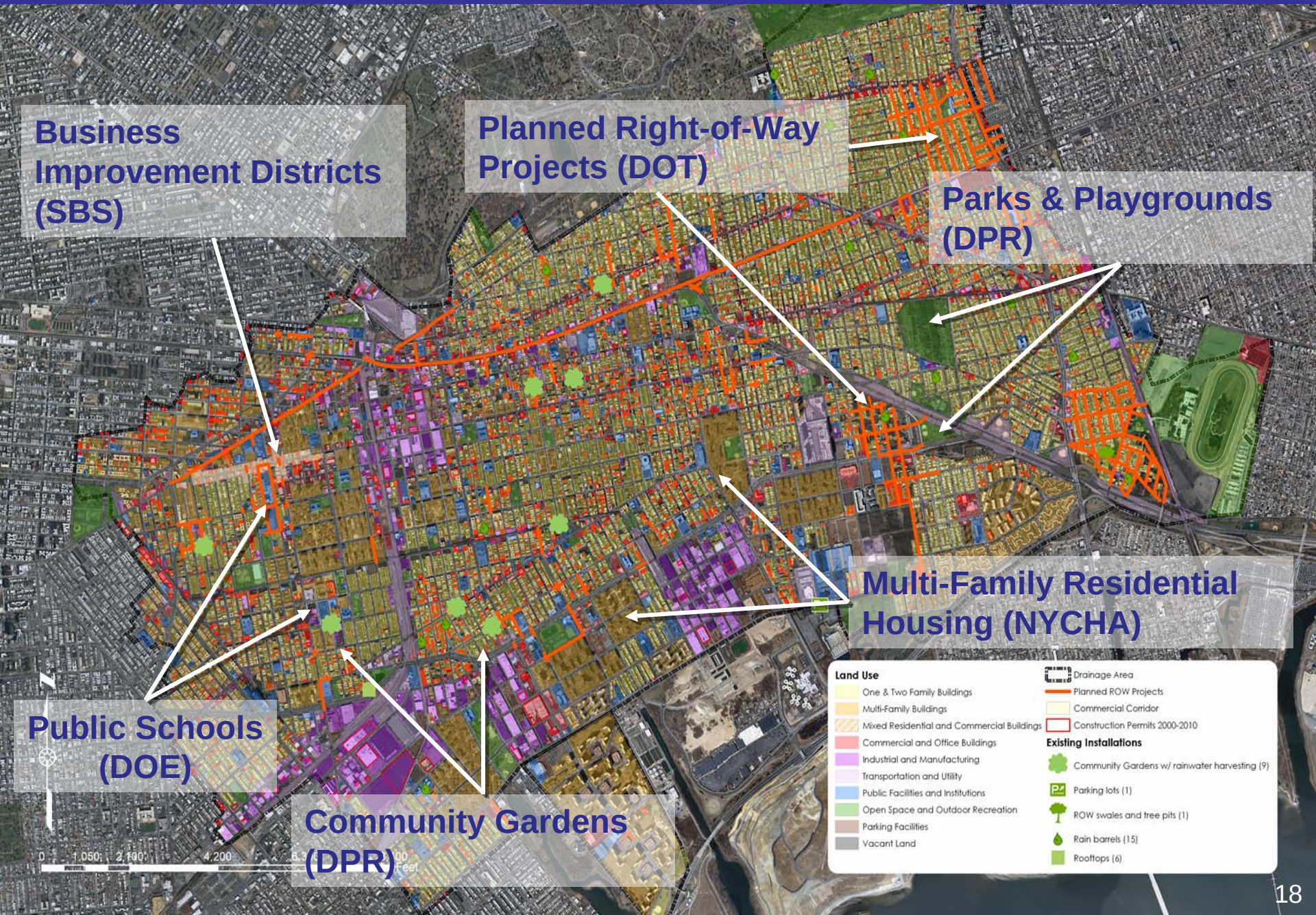
Plants Cool the City



Green infrastructure and Watershed-Level Planning



Implementation: Jamaica Bay & CSO Tributaries



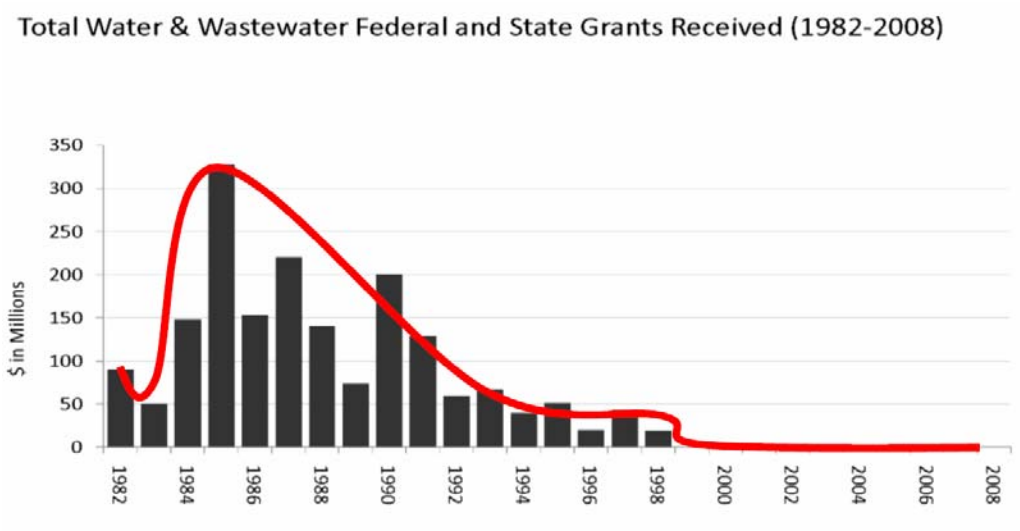
Compliance Costs

- The costs of clean water are rising
- NYC spent $18 billion for key water projects from 2002 to 2009, more than any other social category
- Another $17.5 billion in funding is outlined in current 10-year capital plan (FY10-19) for new regulatory requirements and system reliability

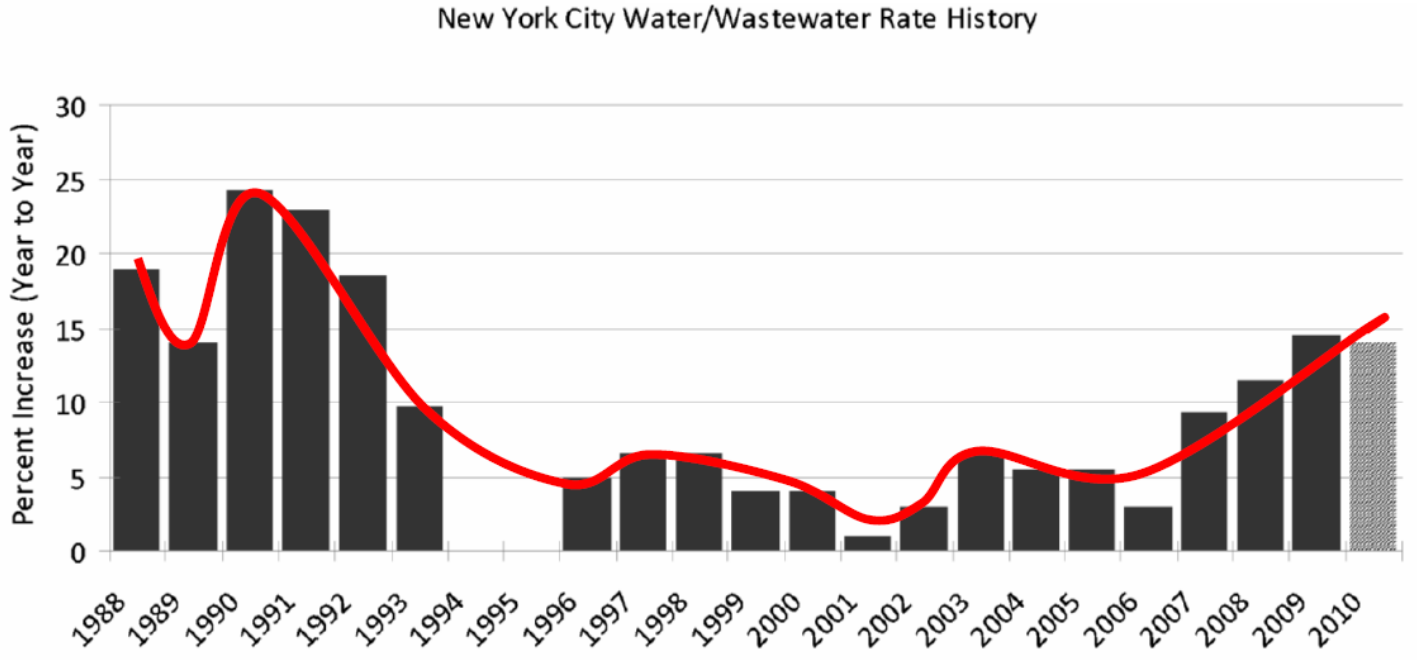
Category	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	Total	Share
Environmental Protection	**$1,871**	**$1,380**	**$1,714**	**$2,339**	**$1,741**	**$3,689**	**$3,050**	**$2,174**	**$17,958**	**28%**
Education	1,350	984	612	2,208	2,030	3,238	3,337	2,866	16,625	26%
Transportation	359	1,155	877	692	579	650	1,183	918	6,413	10%
Parks & Public Buildings	336	328	319	303	389	571	710	692	3,648	6%
Technology & Equipment	225	213	180	297	410	706	864	664	3,559	6%
Housing	438	313	283	423	356	299	453	358	2,923	5%
Economic Development	193	255	221	215	168	175	398	373	1,998	3%
Public Protection	300	290	164	186	289	250	260	257	1,996	3%
Hospitals	121	104	90	451	307	230	231	281	1,815	3%
Sanitation	216	159	140	137	77	189	173	171	1,262	2%
All Other	804	618	434	519	470	547	1,046	777	5,215	8%
Total Commitments	$6,213	$5,799	$5,034	$7,770	$6,816	$10,544	$11,705	$9,531	$63,412	100%

Source: New York City Office of the Comptroller, Comprehensive Annual Report, Fiscal Years 2002-2009; Registered Contracts

Financing Limitations



- Grants are down
- Rates have been increasing



Source: NYC Water Board Bluebook, April 2009