Environmental Protection

Cas Holloway, Commissioner

Michael R. Bloomberg, Mayor

Sustainable Water Resource Planning in New York City

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About DEP

- DEP provides more than 1 billion gallons (3.8 billion liters) of water each day to more than 9 million residents, including 8 million in NYC.

- NYC remains one of only five large cities in the United States that is not required to filter its drinking water.

About DEP

- NYC watershed extends more than 125 miles (200 km) from the city, and comprises 19 reservoirs, and 3 controlled lakes.
- Catskill and Delaware watersheds currently supply 100% of demand. Croton watershed has potential to meet up to 30% of demand.

About DEP

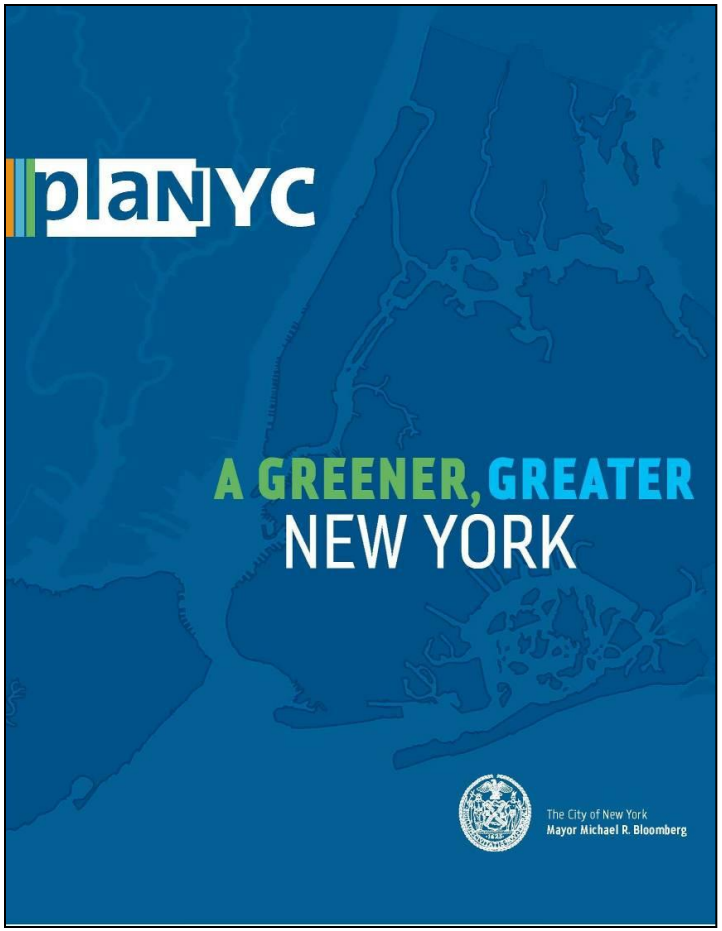
- Approximately 7,000 miles (11,000 km) of water mains, tunnels and aqueducts bring water to homes and businesses throughout the City.

About DEP

- Approximately 7,400 miles (12,000 km) of sewer lines take wastewater to 14 treatment plants.
- DEP also manages stormwater throughout the City, and ensures that the City's facilities comply with the Clean Water Act and other federal, state and local rules.

Sustainability in NYC

❖ PlaNYC is a roadmap to achieve 10 goals:



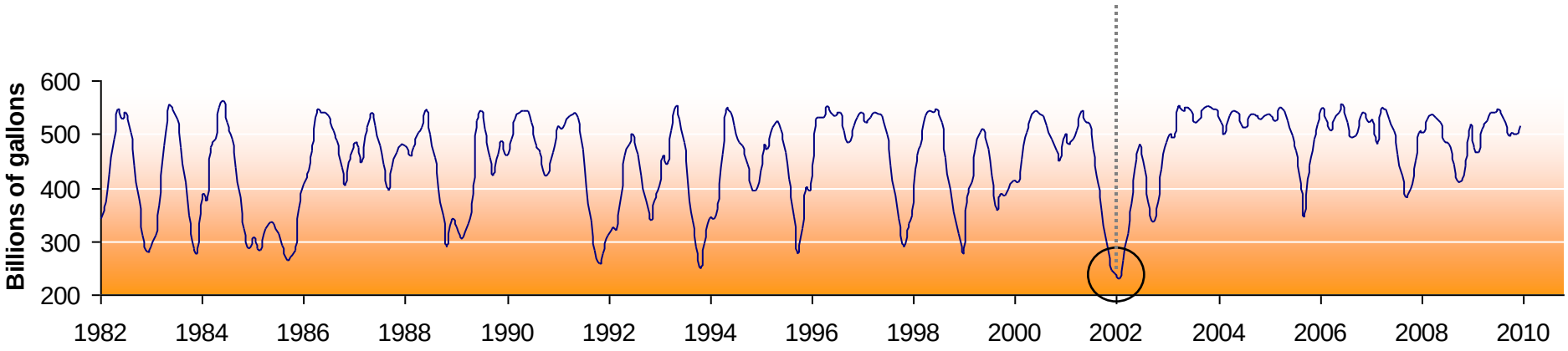
1. Create enough housing for our growing population
2. Ensure all New Yorkers have parks within a 10-minute walk
3. Clean up all contaminated land in New York City
4. Develop water network back-up systems
5. Open waterways to recreation and protect natural areas
6. Improve travel times by adding transit capacity for millions
7. Achieve “State Of Good Repair” on transportation system
8. Upgrade energy infrastructure to provide clean energy
9. Achieve the cleanest air of any big city in America
10. Reduce global warming emissions by 30%

Climate Change in NYC

	Baseline 1971-2000	2020s	2050s	2080s
Air temperature Central range[2]	55° F 13 C	+ 1.5 to 3.0° F + 0.8 to 1.7 C	+ 3.0 to 5.0° F + 1.7 to 2.8 C	+ 4.0 to 7.5° F + 2.2 to 4.2 C
Precipitation Central range[2]	46.5 in^3 762 cm^3	+ 0 to 5 %	+ 0 to 10 %	+ 5 to 10 %
Sea level rise[3] Central range[2]	NA	+ 2 to 5 in + 5 to 13 cm	+ 7 to 12 in + 18 to 30 cm	+ 12 to 23 in + 30 to 58 cm
Rapid ice-melt scenario[4]	NA	~ 5 to 10 in ~ 13 to 25 cm	~ 19 to 29 in ~ 48 to 74 cm	~ 41 to 55 in ~ 1.0 to 1.4 m

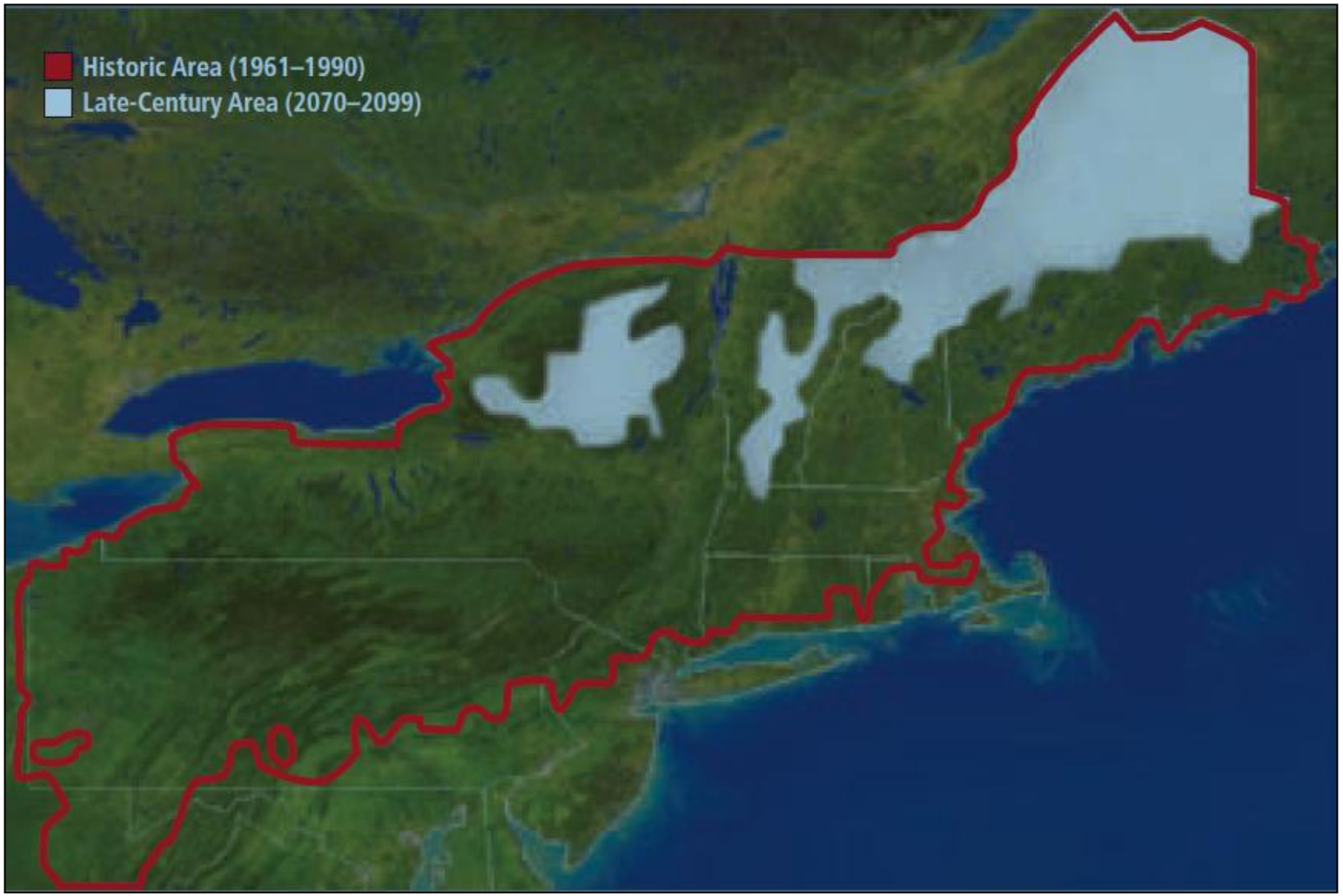
Source: Columbia University Center for Climate Systems Research

Managing Climate Change Risk



Managing Climate Change Risk

- Winter snowpack is another freshwater “reservoir” that may be impacted by climate change.

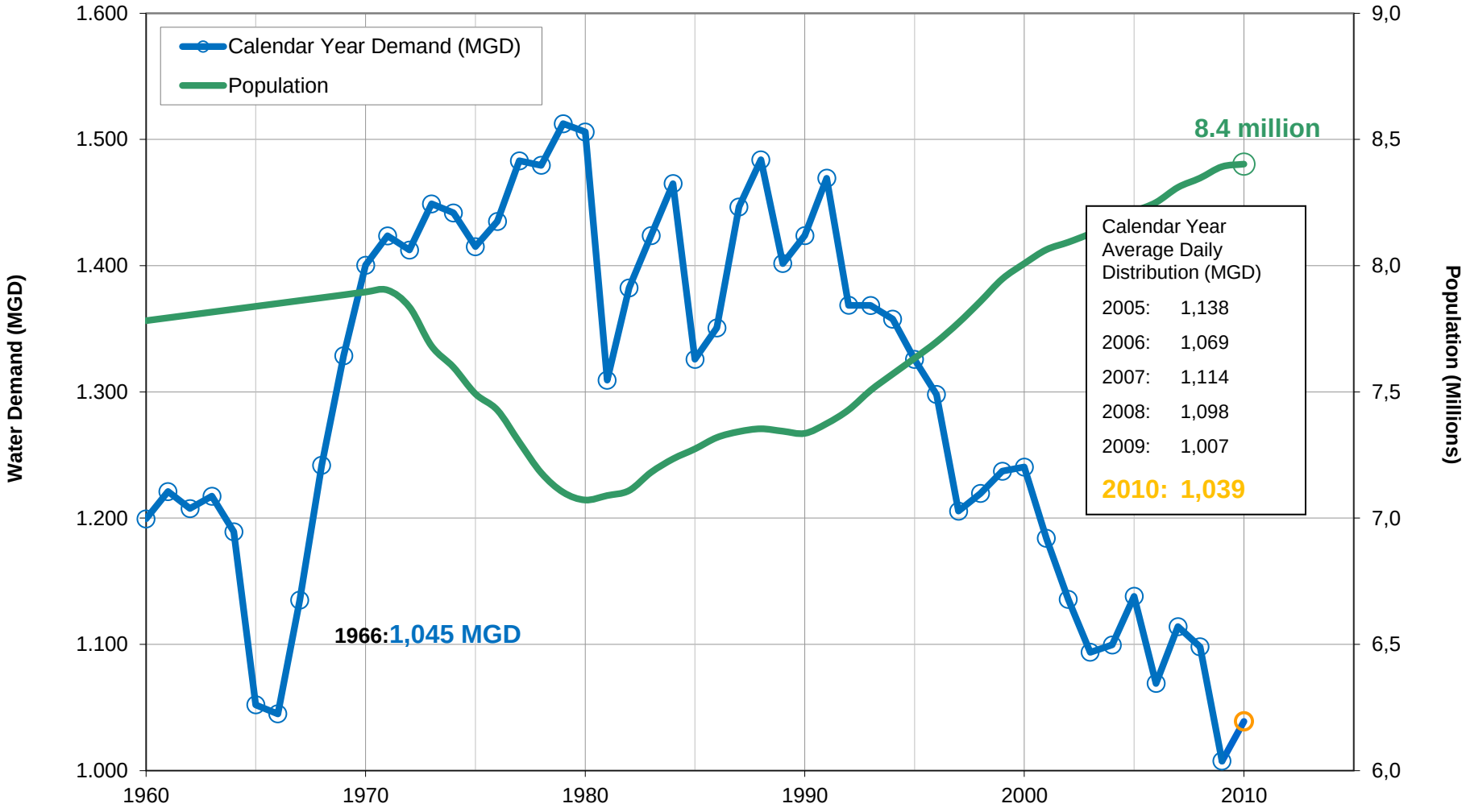


Source: Union of Concerned Scientists

Managing Climate Change Risk

Historical Water Distribution & Population

- Water use has declined since the mid-1990s despite increasing population.
- 2009 and 2010 consumption were the lowest since the 1960s drought of record.



Sustainable Drinking Water Management

Filtration Avoidance Determination

- Over **$1 billion** invested in watershed protection since 1993.
- Enables us to deliver water that meets EPA standards without building a Catskill-Delaware filtration facility.
- A new filtration plant would be costly to build and operate, would increase our energy consumption and our GHG emissions.

Sustainable Drinking Water Management

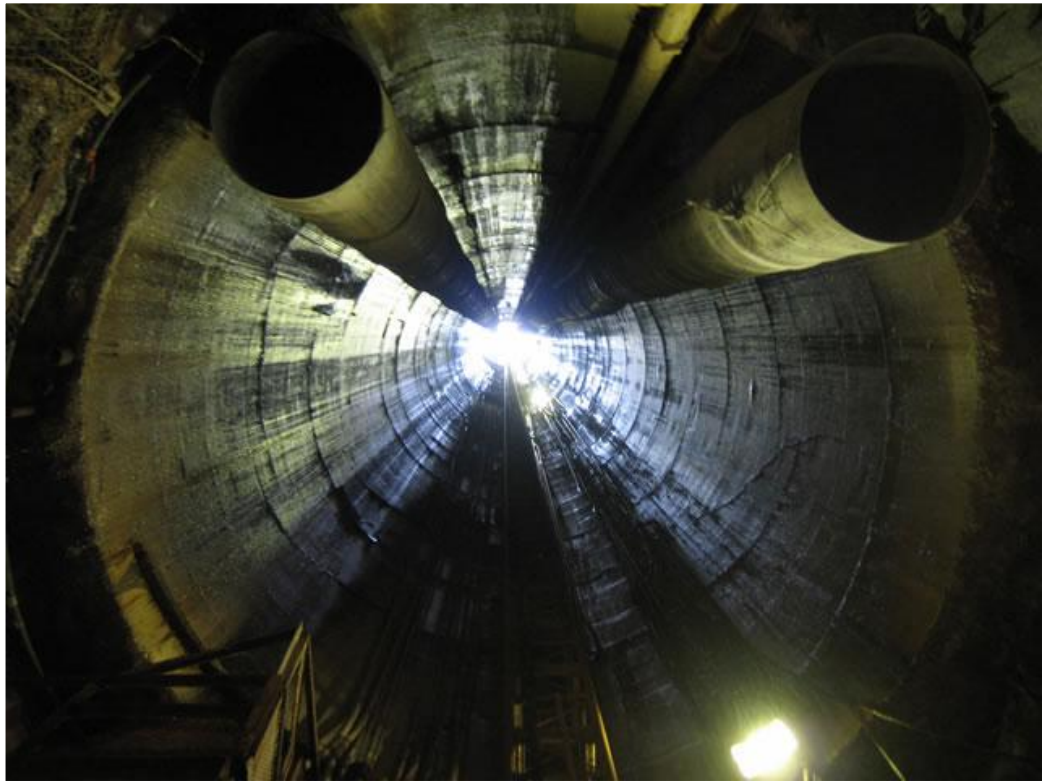
Flexible Flow Management Program

- Program to manage Delaware reservoir diversions and releases.

- Objectives include:
  - mitigating flooding in downstream communities.
  - ensuring sustainability of Delaware system by balancing withdrawal for drinking water, aquatic resource needs and salt front repulsion.

- Will yield a more natural flow regime for Delaware River fisheries.

Sustainable Drinking Water Management



Resiliency and Flexibility Measures

- New parallel tunnel
- System interconnections
- Automated meter reading
- Enhanced water conservation
- Filtration of 10%-30% of supply

Managing Climate Change Risk

- More intense rainstorms can overwhelm the system's capacity to drain and treat stormwater.

Managing Climate Change Risk

- Storms and sea level rise may overwhelm wastewater treatment plants

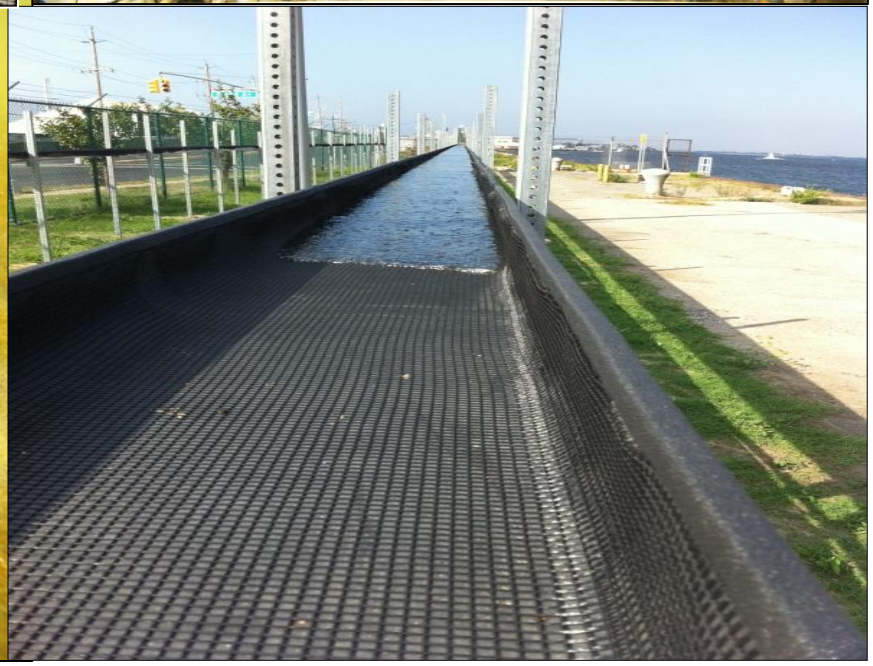
March 2001:

Treated water backup at Hunts Point WWTP

Improving New York Harbor

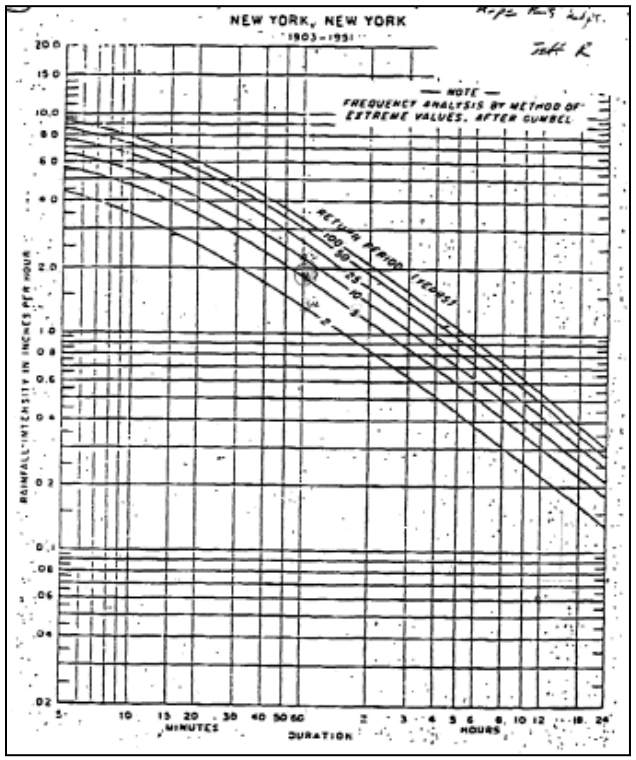
- NYC is implementing measures to improve water quality that maximize benefits for natural habitats, support public recreation, and enhance waterfront and upland communities.

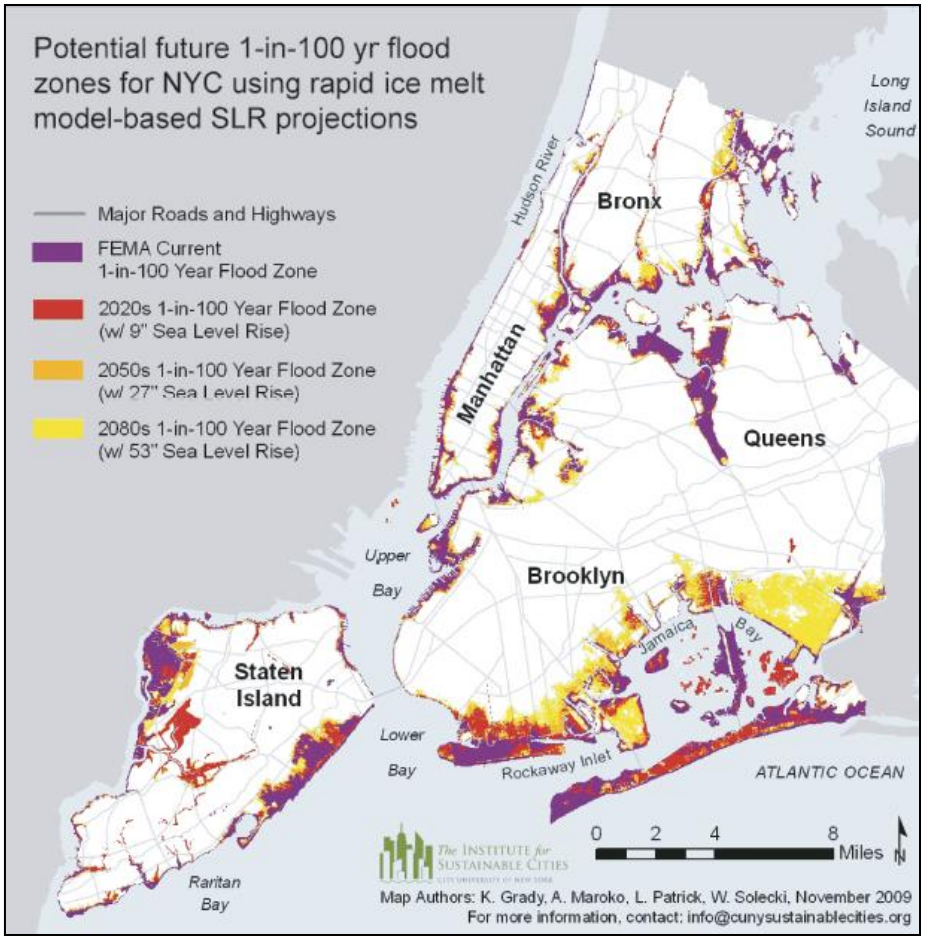
Restoring Jamaica Bay



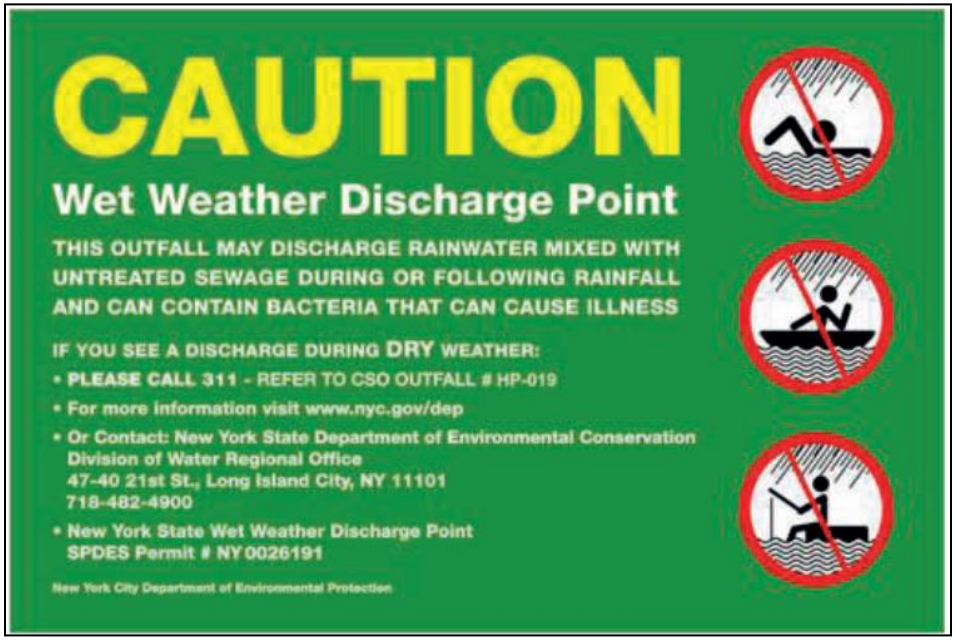
Climate Change Adaptation Study

- Assess vulnerabilities and develop adaptation strategies for:
  - Drainage system
  - Wastewater treatment plants
  - Areas of population growth





Sustainable Stormwater Management



Dense, Efficient Settlement is Impervious

Portfolio for Water as a Waste and a Resource

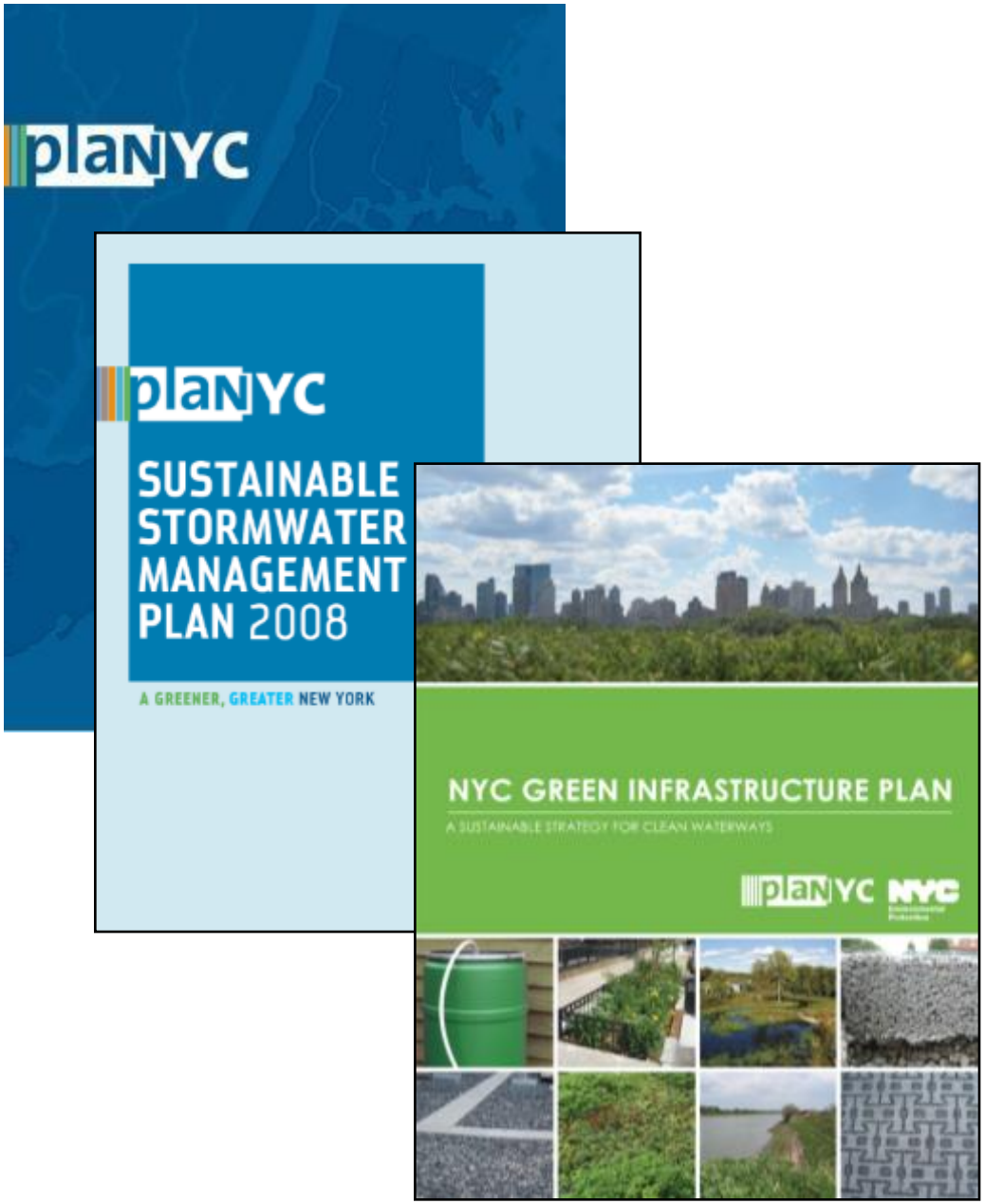
Paerdegat Detention Facility

Staten Island Bluebelt

Catch Basins

Enhanced Tree Pit

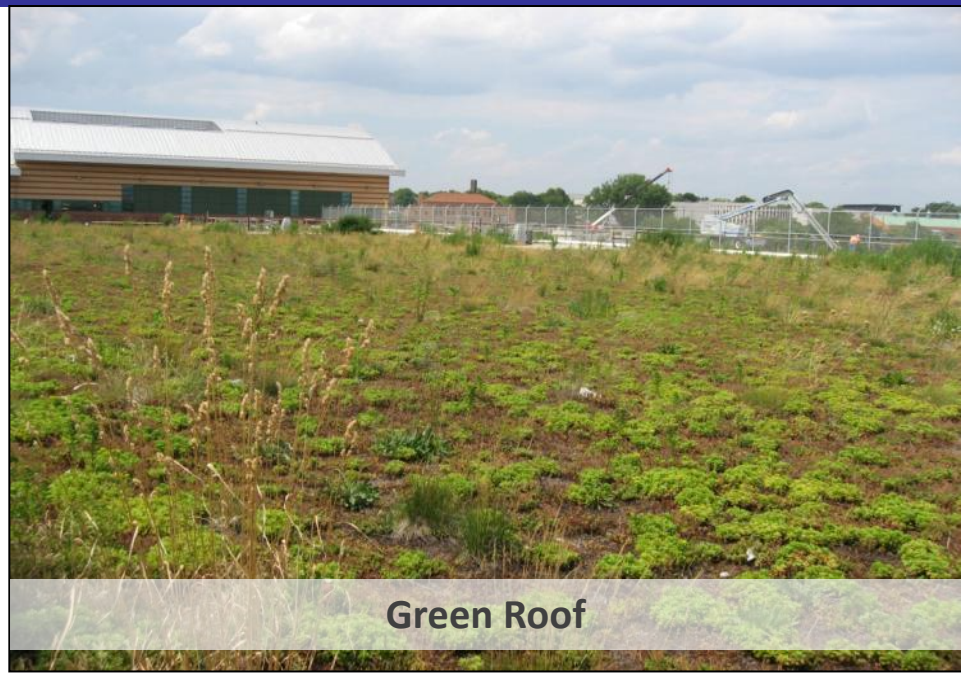
A Sustainable, Hybrid Approach



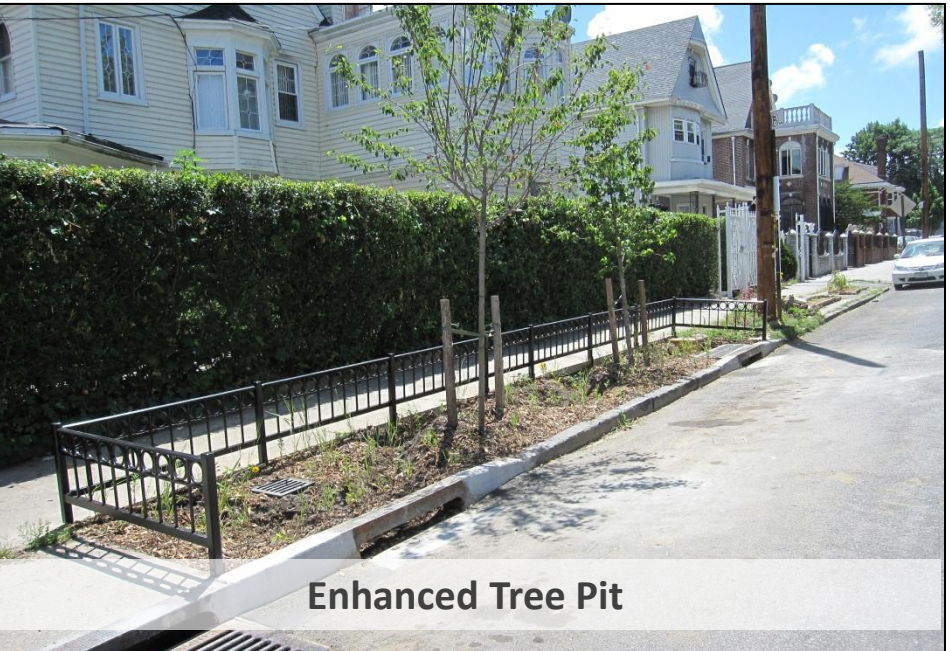
1. Build cost-effective grey infrastructure
2. Optimize the existing wastewater system
3. Control runoff from 10% of impervious surfaces through green infrastructure and other source controls
4. Institutionalize adaptive management, model impacts, measure CSOs, and monitor water quality
5. Sustain stakeholder engagement

Green Infrastructure Examples

Blue Roof



Green Roof



Enhanced Tree Pit

Porous Pavement

Green Infrastructure Adds Value to the City

Construction of Enhanced Tree Pit Transforms a Commercial Strip in Sutter Avenue, Brooklyn

June 2010

Staten Island Bluebelt

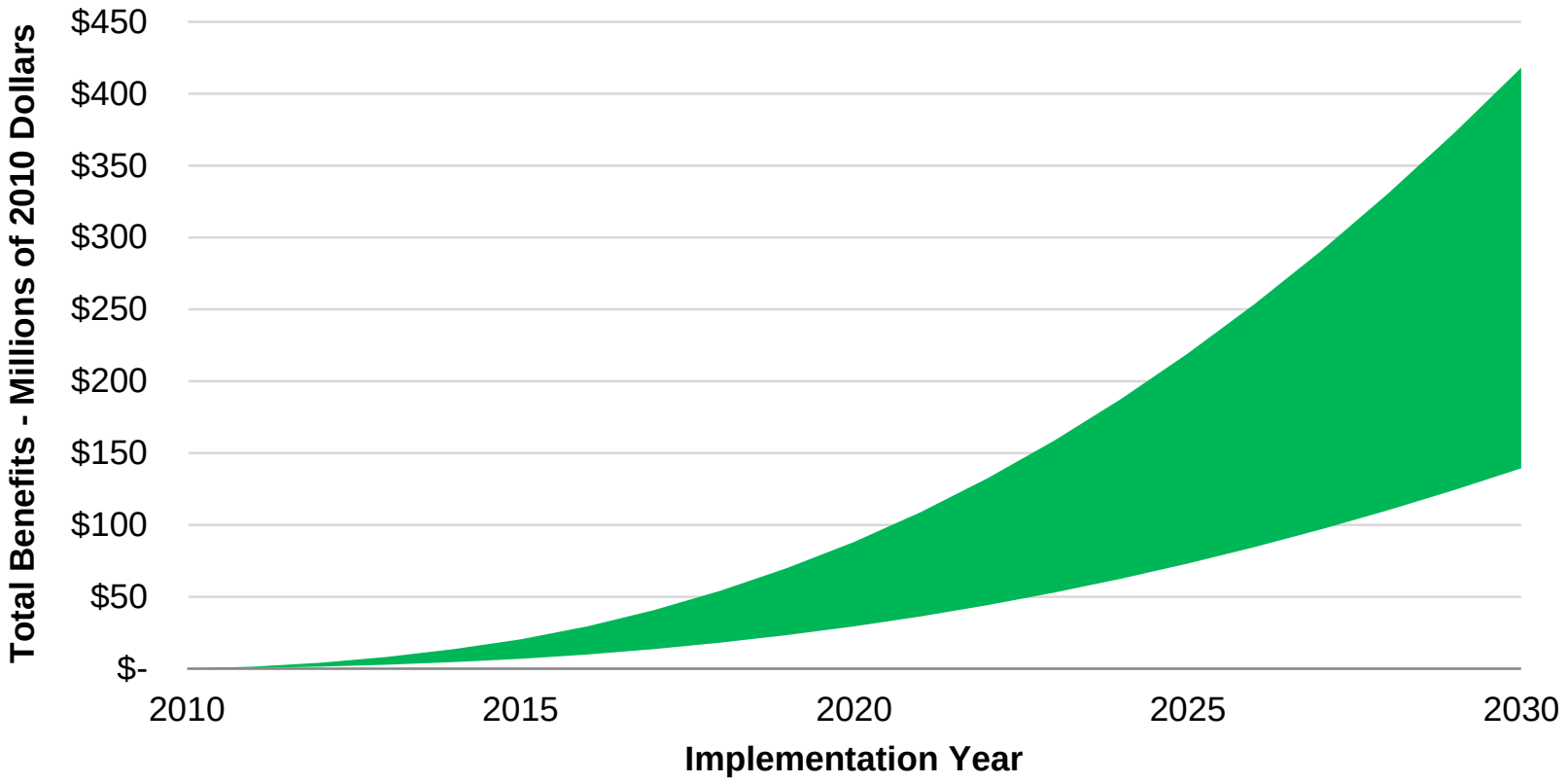
Before

After

Positive Co-Benefits of Green Infrastructure

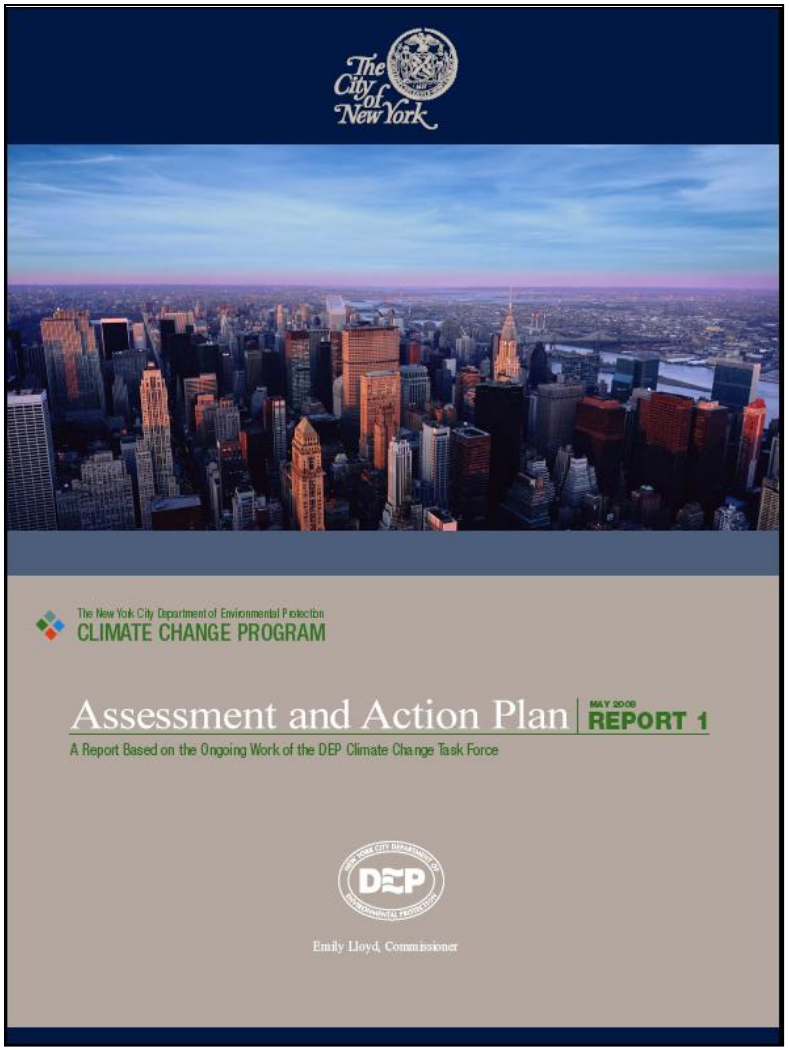
Annual benefits of green infrastructure per acre	
Reduced energy demand:	$5,513
Reduced carbon dioxide:	$117
Improved air quality:	$759
Increased property value:	$4,725

Acres of planted green infrastructure in 2030	
25% planted green infrastructure	1,085 acres
75% planted green infrastructure	3,255 acres



DEP Climate Change Program Goals

1. **Improve Regional Climate Change Projections**
2. **Quantify Potential Climate Change Impacts on NYC Water Systems**
3. **Determine and Implement Appropriate Adjustments to NYC's Water Systems**
4. **Inventory and Reduce GHG Emissions**
5. **Improve Communication and Tracking Mechanisms**



QUESTIONS?

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