



# Every Utility Needs a Do Over – New York City's Wet Weather Program

---

NACWA Annual Developments in Clean Water  
Conference

Robin Levine, NYCDEP General Counsel

November 17, 2011

# NYC Department of Environmental Protection



## ❖ Supply 1 billion gallons of water per day to 9 million New Yorkers

- ❖ 19 storage reservoirs and 3 controlled lakes
- ❖ 295 miles of aqueduct and tunnels
- ❖ 7,000 miles of water mains
- ❖ 109,000 fire hydrants



## ❖ Treat 1.3 billion gallons of wastewater per day

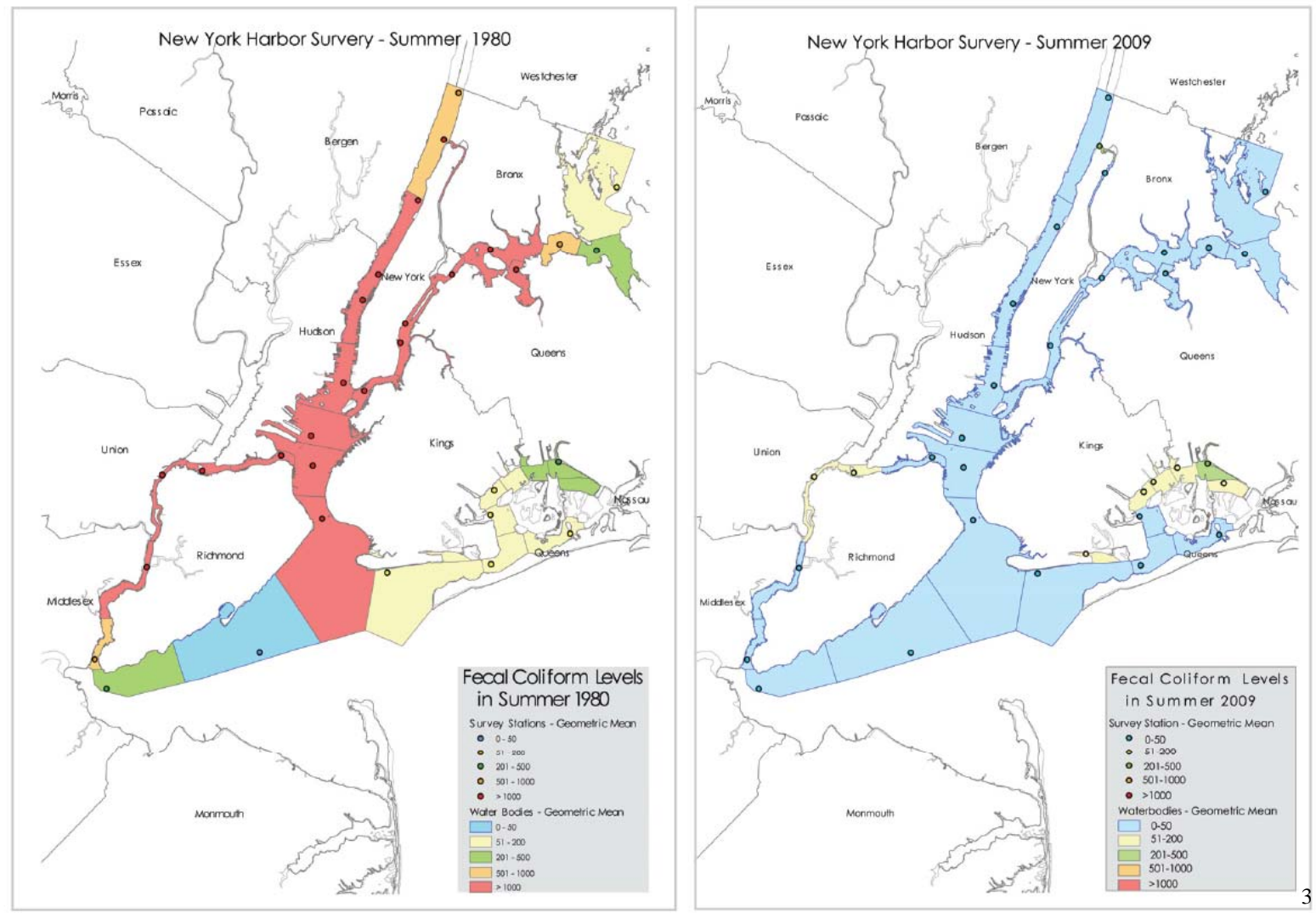
- ❖ 14 In-city treatment plants; 8 upstate
- ❖ 95 pump stations



## ❖ \$14 billion in active construction & design projects



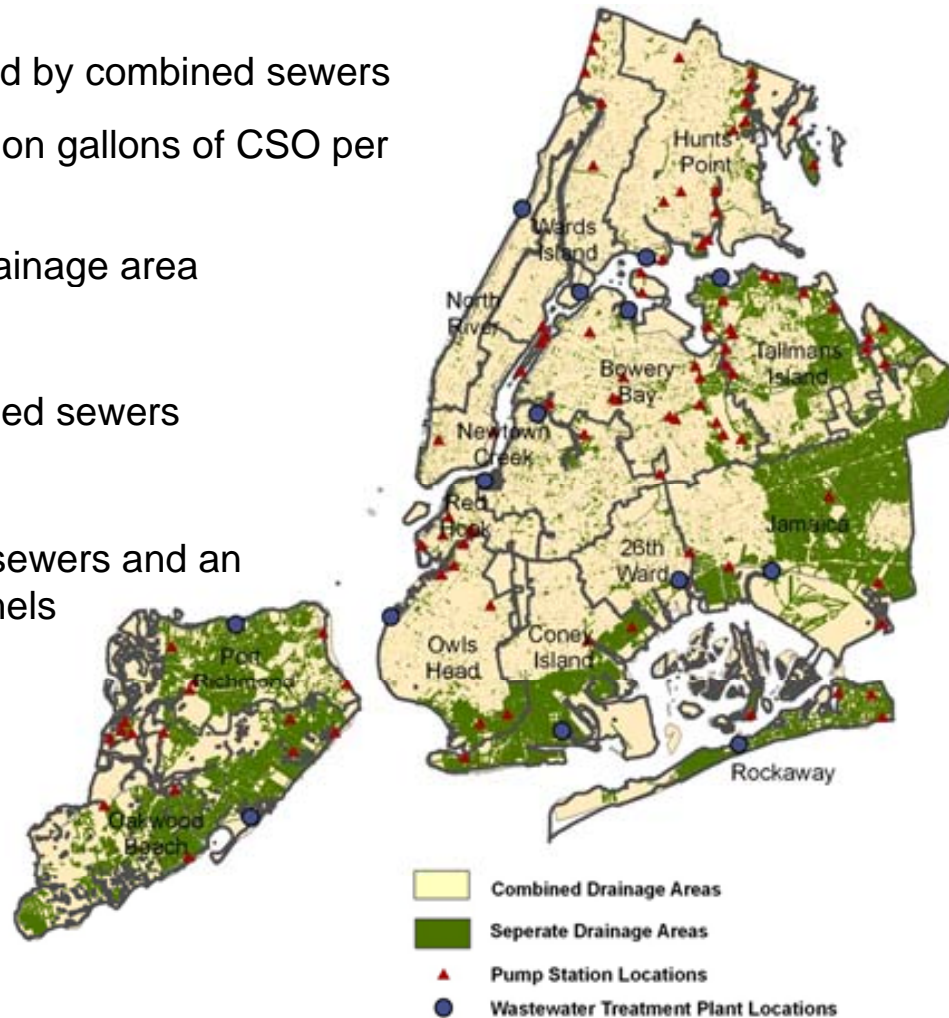
# Water Quality Improvements Over the Last 30 Years



## NYC's Collection & Treatment System is Large & Complex



- ❖ **Two-thirds of NYC** served by combined sewers
- ❖ Model estimates of 29 billion gallons of CSO per year
- ❖ **216,000 acres** of CSO drainage area
- ❖ 7,400 miles of sewers
  - ❖ 3,337 miles of combined sewers
- ❖ 144,000 catch basins
- ❖ 138 miles of intercepting sewers and an additional 11 miles of tunnels
- ❖ 422 CSO outfalls



## DEP's CSO Program



- ❖ City has been working on a wet weather program for many years
- ❖ Program has had to adapt, and the controlling legal documents have had to be modified, to adjust to:
  - ❖ Implementation challenges
  - ❖ Changes in law
  - ❖ Fiscal constraints
  - ❖ Shifting public priorities
  - ❖ Advances in technology
- ❖ All these drivers have resulted in a number of “do overs” to DEP’s Wet Weather Program.

## CSO – Initial Program



- ❖ 1972 - Built the Spring Creek Auxiliary Waster Pollution Control Plant
  - ❖ 12 MGD retention tank – one of the first in the country
- ❖ Passage of CWA in 1972 – section 208 required an Area-Wide Wastewater Management Plan
  - ❖ 1979 – Plan was developed to focus on CSOs
- ❖ Environmental priority shifted to upgrading WWTPs to secondary treatment
- ❖ Fiscal constraints

## Early Implementation Challenges



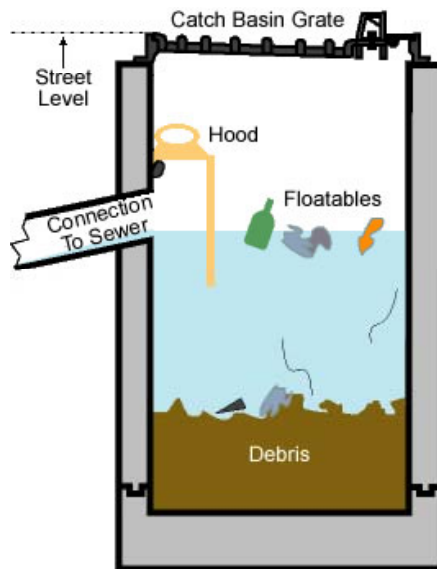
- ❖ 1988 - DEP's SPDES Permits required the development of facility plans for 9 geographic areas; did not meet certain of these permit dates
- ❖ 1992 - NYS DEC Administrative Consent Order
  - ❖ Floatables Capture - concerns about medical waste washing up on beaches
    - ❖ Booming/Skimming Program
    - ❖ Inventory of catch basins
  - ❖ Water Quality (Dissolved Oxygen; Coliform Bacteria) – especially in tributary water bodies
    - ❖ Plan was to build nine large tanks by 2006
- ❖ Implementation challenges - Survey of 95,000 catch basins found at least 57% of catch basins were missing hoods



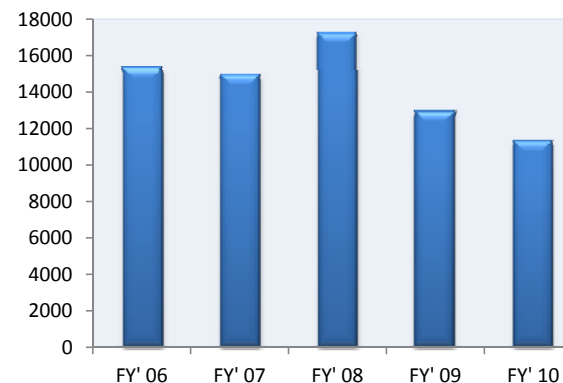
# Successful Implementation of Catch Basin Program



- ❖ DEP has installed hoods on or retrofitted all 144,000 catch basins to protect harbor water from floatables and street debris.
- ❖ Catch basins are inspected on a 3-year cycle by Community Boards.
- ❖ In FY 2010, DEP inspected over 48,000 catch basins and cleaned over 27,000.
- ❖ Since FY 2006, DEP has seen a decline in the number of flooding complaints.



**Catch Basin Clogged - Flooding Complaints**





## 2005 Order – Multiple Change Drivers



- ❖ Regulatory changes
  - ❖ CSO Policy (1994)/Wet Weather Act of 2000
    - ❖ Required development of Long Term Control Plans
    - ❖ Required design and implementation of 9 Minimum Controls (BMPs)
- ❖ Implementation Challenges
  - ❖ Siting large tanks in a dense city proved extremely challenging
  - ❖ By 2005, 7 tanks were to be completed; none were
- ❖ Fiscal Challenges
  - ❖ Costs of building tanks had significantly escalated
  - ❖ Dramatic fall off in availability of grant funding

## 2005 CSO Order - Key Elements



- ❖ Aligned DEP's CSO Program with the Wet Weather Act of 2000
- ❖ Stretched out project implementation to ease financial burden
- ❖ Incorporated lower cost system optimization strategies (e.g. regulator automation; inline storage)
- ❖ Provided technical analysis documented improved projected performance of 2005 Order vs. 1992 Order
  - ❖ Modeling showed
    - ❖ increase in wet weather capture from 70.2% (1992 Order) to 75% (2005 Order)
    - ❖ reduction in CSOs from 32.4B/year (1992 Order) to 27.2B/year (2005 Order)

## 2005 CSO Order Implementation



- ❖ \$1.7 billion in CSO controls invested
- ❖ Detention facilities built or rehabilitated
  - Spring Creek
  - Alley Creek
  - Flushing Creek
  - Paerdegat Basin
- ❖ Collection system improvements
  - Regulator improvements (bending weirs, automation)
  - Throttling facilities
  - Inflatable dams
  - Pumping station upgrades
  - Sewer extensions
  - Strategic separation
- ❖ Water Quality Improvements
  - Dredging
  - Aeration
  - Floatables controls
- ❖ 144,000 catch basins inspected on a 3 year cycle

## 2011 Order – Stormwater as a Resource



**Paerdegat CSO Detention Facility**



**Staten Island Bluebelt**

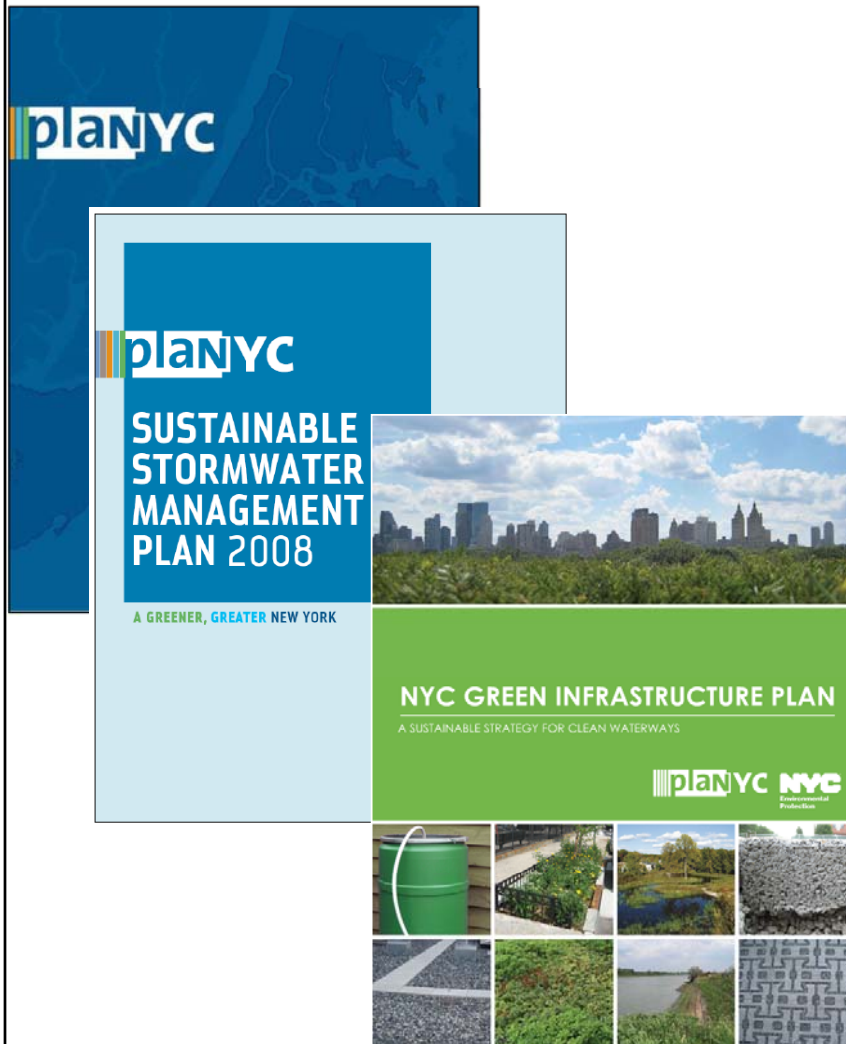


**Catch Basins**



**Stormwater Tree Pit**

# NYC's Hybrid Approach to Wet Weather Control



1. **Build cost-effective grey infrastructure**
2. Optimize existing wastewater system
3. **Control runoff from 10% of impervious surfaces through green infrastructure and other source controls**
  - ❖ Many opportunities in roads and sidewalks, rooftops and new development
  - ❖ Modular, scalable, and adaptable
  - ❖ Targeted to specific watersheds
4. Institutionalize adaptive management, model impacts, measure CSOs, and monitor water quality
5. **Sustained stakeholder engagement**



## The Hybrid Approach Performs Better



- ❖ \$3.4 billion in cost-effective grey infrastructure
  - ❖ 2005 Order – grey costs were estimated to be \$4.8B
  - ❖ Reduce CSOs by 8.3 B/year to 21.5B/year
- ❖ \$2.4 billion commitment to green strategy
  - ❖ 1.5 billion of public funding
  - ❖ \$900 million in private investment (stormwater management standard for new construction and redevelopment that expands existing development)
  - ❖ Reduce CSOs by more than 1.5 billion gallons per year
- ❖ Optimize the existing wastewater system through cleaning of interceptor sewers to reduce CSOs by approximately 586 million gallons per year.

## Incorporating Hybrid Approach Into Consent Order



- ❖ Milestones for grey infrastructure projects
- ❖ Milestones for green infrastructure: control one inch of rain on impervious surfaces
  - 2015 – 1.5%
  - 2020 – 4%
  - 2025 – 7%
  - 2030 – 10%
- ❖ Performance metrics – model CSO reductions from green infrastructure
- ❖ LTCPs will build upon citywide targets with a mix of grey and green projects to meet water quality goals in a cost-effective manner



## More Flexible Enforcement Mechanisms



- ❖ Initial GI milestone - forgiveness language
- ❖ All GI milestones
  - ❖ Best efforts provisions recognize possibility of needing more time to roll out GI
  - ❖ Provide contingency plans
- ❖ Additional GI grant funds in lieu of penalties

## CSO Order Achievements



- ❖ DEP's strategy to manage wet weather is multi-pronged, comprehensive, and flexible.
- ❖ Notable successes since 1992
  - ❖ Improvements in water quality
  - ❖ Reduction in floatables/clean beaches
  - ❖ Constructed four large CSO facilities
- ❖ Adjustments along the way to respond to; more changes likely
  - ❖ Implementation challenges
  - ❖ Regulatory changes
  - ❖ Fiscal constraints
  - ❖ New technologies
  - ❖ Climate change - Increased and more intense rainfall

## Critical Elements for Any Do Over



- ❖ Drive change through continued evaluation of technological advances and adapt to regulatory changes
- ❖ Maintain a transparent relationship with regulators
- ❖ Demonstrate commitment to implement program through
  - ❖ optimization of the investments (catch basins)
  - ❖ robust investment in sewers, CSOs facilities, and wastewater treatment infrastructure.
- ❖ Develop scientific support for changes sought - modifications should improve water quality; demonstrate through detailed planning and modeling
- ❖ Moving ahead even in advance of full regulatory buy-in e.g. piloting green infrastructure; implementation of GI private grant program
- ❖ Advocate for legislative/regulatory relief – EPA's recent memo recognizing need to balance competing CWA mandates is a step in the right direction – should be expanded to all environmental mandates