



On July 20th, 2016, DEP joined the Newtown Creek Alliance for a canoe tour of Newtown Creek



Newtown Creek Combined Sewer Overflow Long Term Control Plan

Public Kickoff Meeting

Location: Newtown Creek WWTP

Date: November 15, 2016

	Topic	Speaker
1	Welcome & Introductions	Mikelle Adgate
2	Waterbody & Watershed Characteristics and Water Quality Sampling	Keith Mahoney
3	Water Quality Improvement Projects <ul style="list-style-type: none">• Grey Infrastructure• Green Infrastructure	Keith Mahoney Pinar Balci
4	LTCP Modeling & Alternative Development Process	Keith Mahoney
5	Next Steps	Mikelle Adgate
6	Discussion and Q&A Session	All

Welcome & Introductions

Mikelle Adgate
Director of Stormwater Management Outreach
DEP – BPA

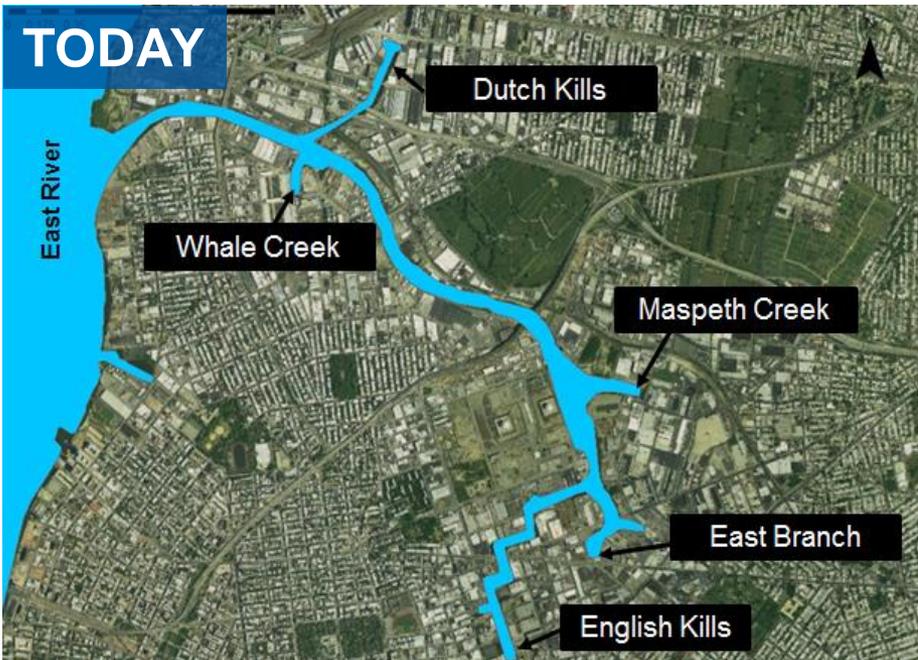
Newtown Creek: Historical Context

1800's



- The shoreline of Newtown Creek in the 1800's – the system has since been drastically altered.

TODAY



- Urban development throughout the decades has led to a highly impervious watershed in Newtown Creek.

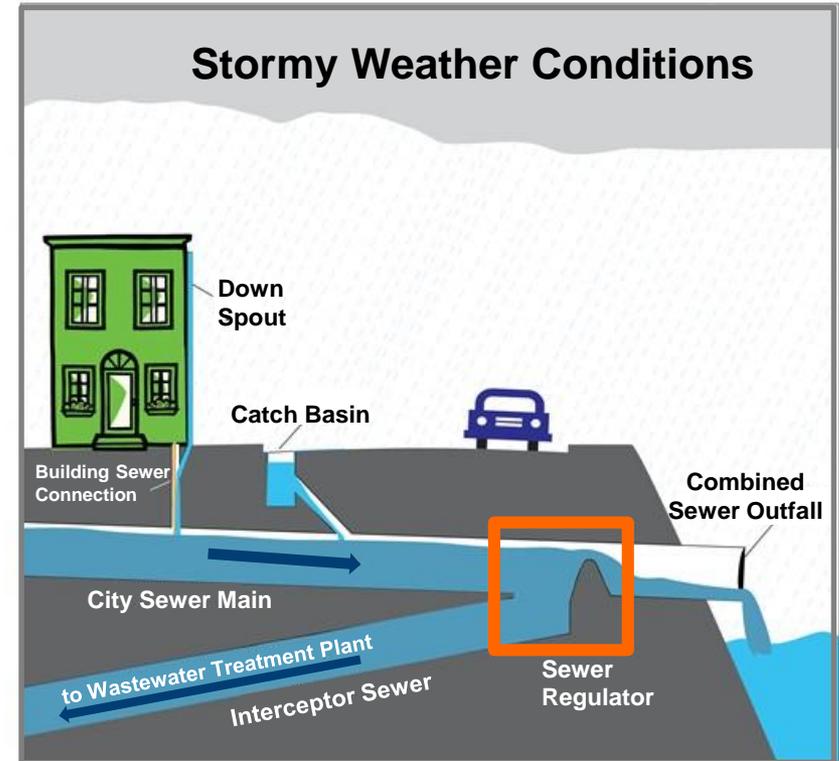
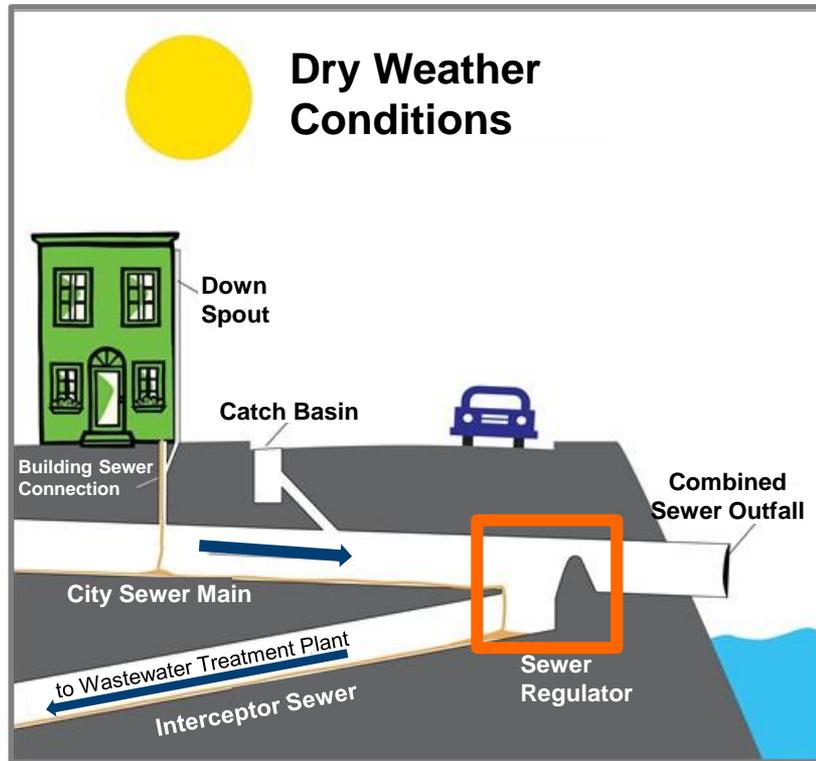
- **September 29, 2010:** Newtown Creek designated as Superfund Site

 - **July 2011:** EPA administrative order to 6 potential responsible parties (PRPs):
 - 1) Phelps Dodge Refining Corporation
 - 2) Texaco, Inc.
 - 3) BP Products North America Inc.
 - 4) National Grid NY
 - 5) ExxonMobil Oil Corporation
 - 6) The City of New York
- 
- Newtown Creek
Group (NCG)***

*Tonight's meeting will focus on Newtown Creek LTCP
and Clean Water Act Requirements*

What is a Combined Sewer Overflow (CSO)?

- NYC's sewer system is approximately 60% combined, which means it is used to **convey both sanitary and storm flows**.



- 65% to 90% of **combined** sanitary & storm flow is captured at treatment plants.
- When the sewer system is at full capacity, a diluted mixture of rain water and sewage may be released into local waterways. This is called a combined sewer overflow (CSO).

- Rainfall characteristics that trigger a CSO event at Newtown Creek:
 - **0.05 to 0.27-inch** of constant rainfall over a period of 2 to 10 hours
 - Of the average 100 rainfall events per year about **63%** may trigger a CSO at Newtown Creek



Photo Credit: Baptisete Pons
<https://www.flickr.com/photos/bpt/2882285636/>

Long Term Control Plan (LTCP)

identifies appropriate CSO controls to achieve applicable water quality standards

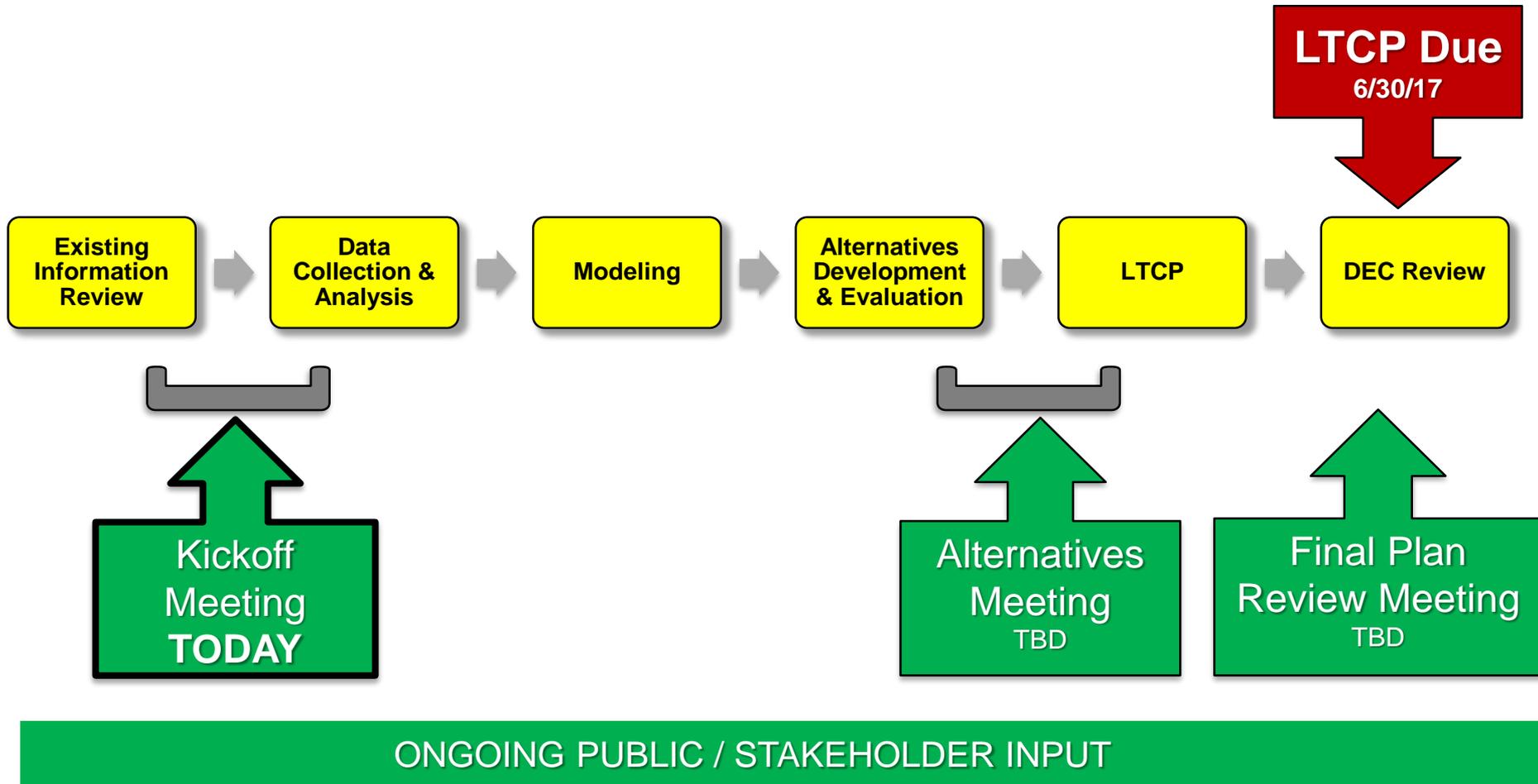
consistent with the Federal CSO Policy and Clean Water Act

CSO Consent Order

an agreement between NYC and DEC that settles past legal disputes without prolonged litigation

DEC requires DEP to develop LTCPs and mitigate CSOs

LTCP Process and Public Involvement



Questions?

Waterbody & Watershed Characteristics and Water Quality Sampling

Keith Mahoney, P.E.
Director of Water Quality Planning
DEP – BEDC

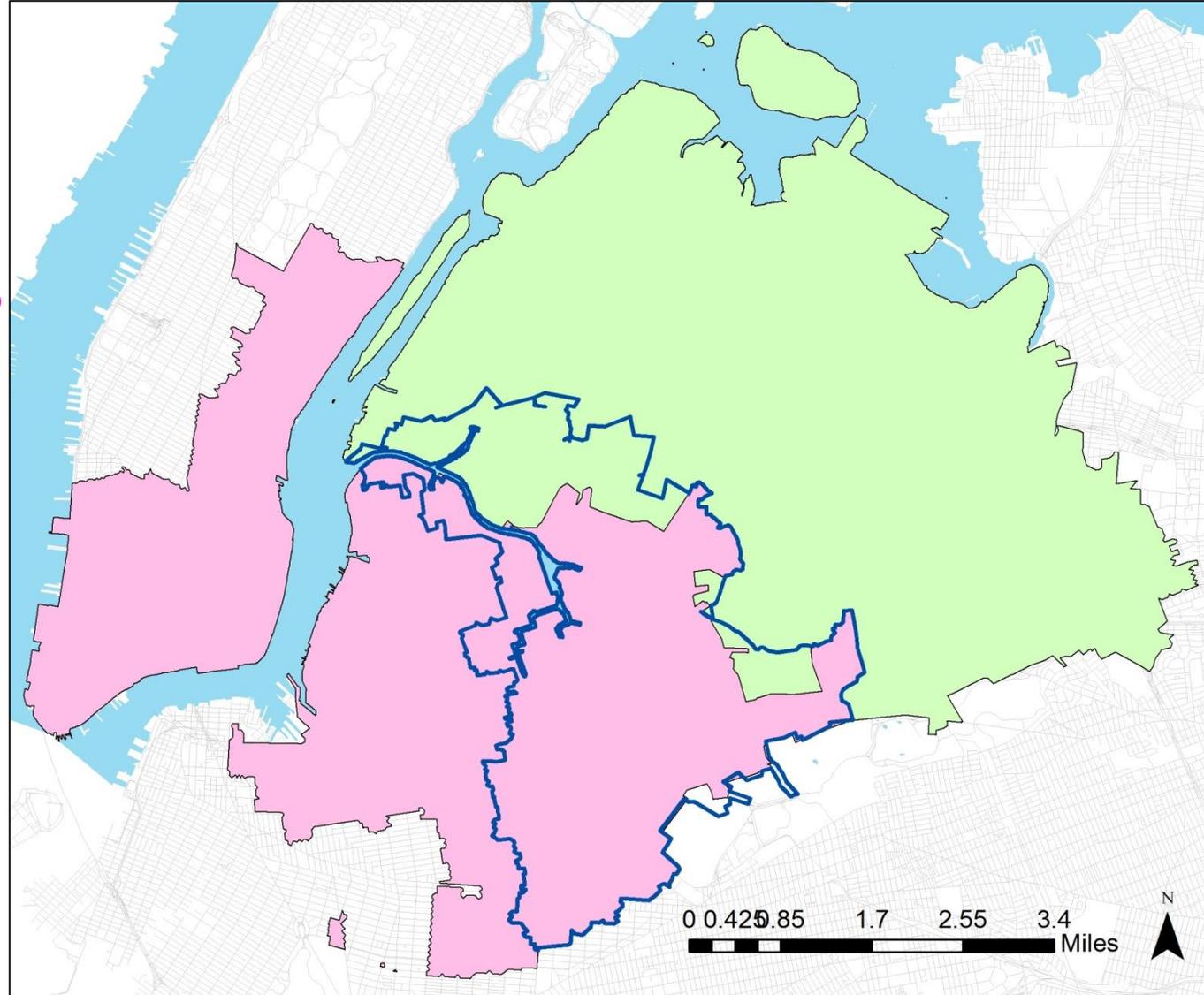
Drainage Areas:

Citywide Drainage Area
≈ 300,000 acres

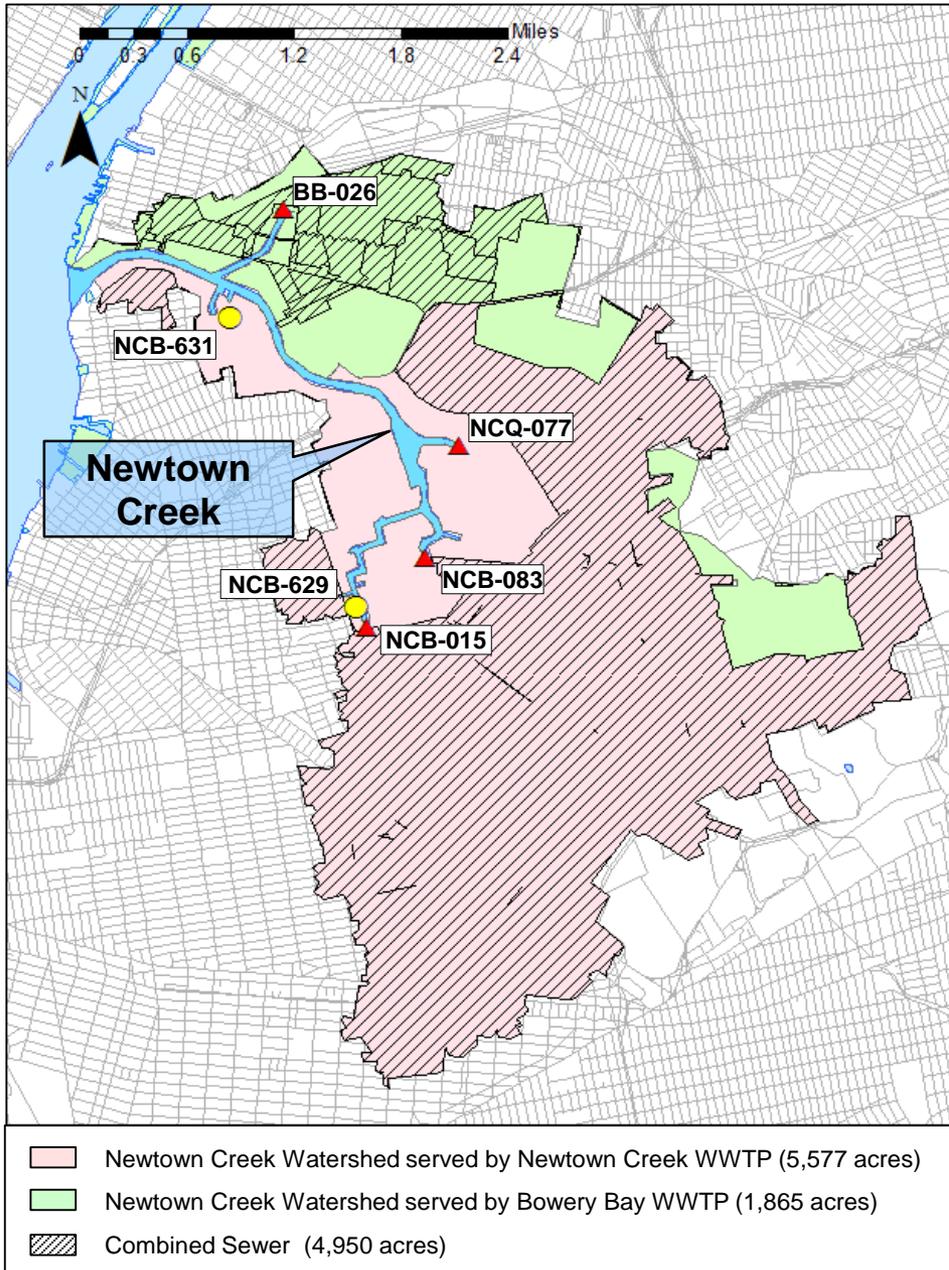
 **Newtown Creek WWTP**
15,033 acres

 **Bowery Bay WWTP**
14,928 acres

 **Portion that Drains to Newtown Creek**
7,442 acres



Newtown Creek Drainage Area



➤ 5 Urban CSO Tributaries

- English Kills
- Dutch Kills
- East Branch
- Whale Creek
- Maspeth Creek

➤ Sewer System

- Newtown Creek (NC) WWTP
- Bowery Bay (BB) WWTP
- 4 Major CSO Outfalls (▲)
- 2 Major DEP owned MS4 Outfalls (●)

Drainage Areas in Acres:

	Total Drainage Area	Area that drains to Newtown Creek	Area that drains to Newtown Creek served by combined sewers
NC WWTP	15,033	5,577	4,636
BB WWTP	14,928	1,865	314
Citywide	~300,000	7,442	4,950

CLASS SD

Fish Survival

The **best usage** of Class SD water is **fishing**. These waters shall be suitable for fish, shellfish, and wildlife survival. In addition, the water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

Parameter	Criteria*	DEC Water Quality Parameter Reference
Fecal Coliform	Monthly Geometric Mean ≤ 200 col/100 mL	<ul style="list-style-type: none"> • New York Codes, Rules and Regulations • (NYCRR Part 703.4)
Total Coliform	Monthly Geometric Mean ≤ 2,400 col/100 mL 80% ≤ 5,000 col/100 mL	<ul style="list-style-type: none"> • New York Codes, Rules and Regulations • (NYCRR Part 703.4)
Dissolved Oxygen	≥ 3.0 mg/L (acute, never less than)	<ul style="list-style-type: none"> • New York Codes, Rules and Regulations • (NYCRR Part 703.3)

* EPA has also proposed a potential future RWQC for enterococcus: 30-Day Rolling GM ≤ 30 col/100 mL.

➤ CSO LTCP Goals and Targets:

- Annual and Seasonal Bacteria Compliance
- Annual Dissolved Oxygen Compliance
- Time to Recovery for Bacteria of ≤ 24 hours
- Floatables Control

Ongoing Receiving Water Sampling Programs



Program	Sampling Frequency	#of Sampling Locations	Parameters		
			Fecal	Entero	*YSI
 Harbor Survey Monitoring	Monthly (Oct – May) Weekly (Jun – Sept)	4			
 Sentinel Monitoring	Quarterly	4			

*YSI Parameters include: Dissolved Oxygen, Temperature, Conductivity, and Salinity.

Flow Monitoring

- 3/1/2014 – 3/31/2015
- 5 locations
- Continuously monitored
- Depth & Velocity measurements

Receiving Water

- 14 locations
- Four 4-day events
- Fecal, Entero, YSI, TSS

CSO / MS4 Sampling

- 4 CSO, 2 MS4 locations
- 4 wet weather events
- Fecal, Entero, YSI, TSS, CBOD, Nitrogen

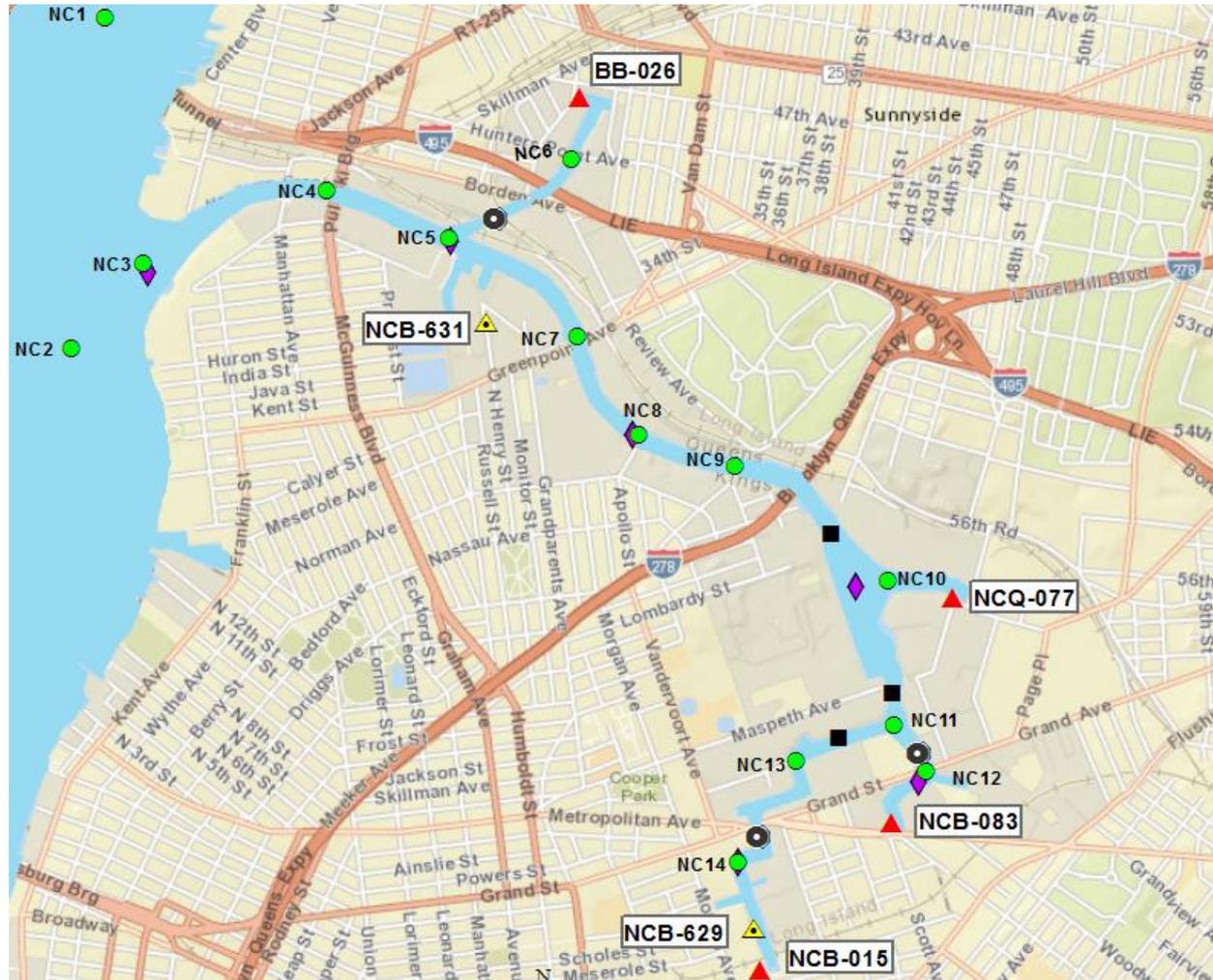
SOD

- 6 locations
- 2 dry & 2 wet-weather events

Data Sondes / ADCPs

- 3 locations
- Continuous over 60 days
- Temperature, DO, Salinity

Sampling Period: 7/1/2016 – 10/31/2016



Parameter	Value
Duration of Study	March 28, 2014 to March 27, 2015
No. of CSO Outfalls Monitored	5
No. of Monitored Rain Events per Location	60 to 119 per location
No. of CSO Monitored Events per Location	24 to 51 per location
Range of Monitored CSO Volume	21 MG to 440 MG per location

Fecal Coliform Sampling – Geometric Means

January 1, 2016 to September 30, 2016

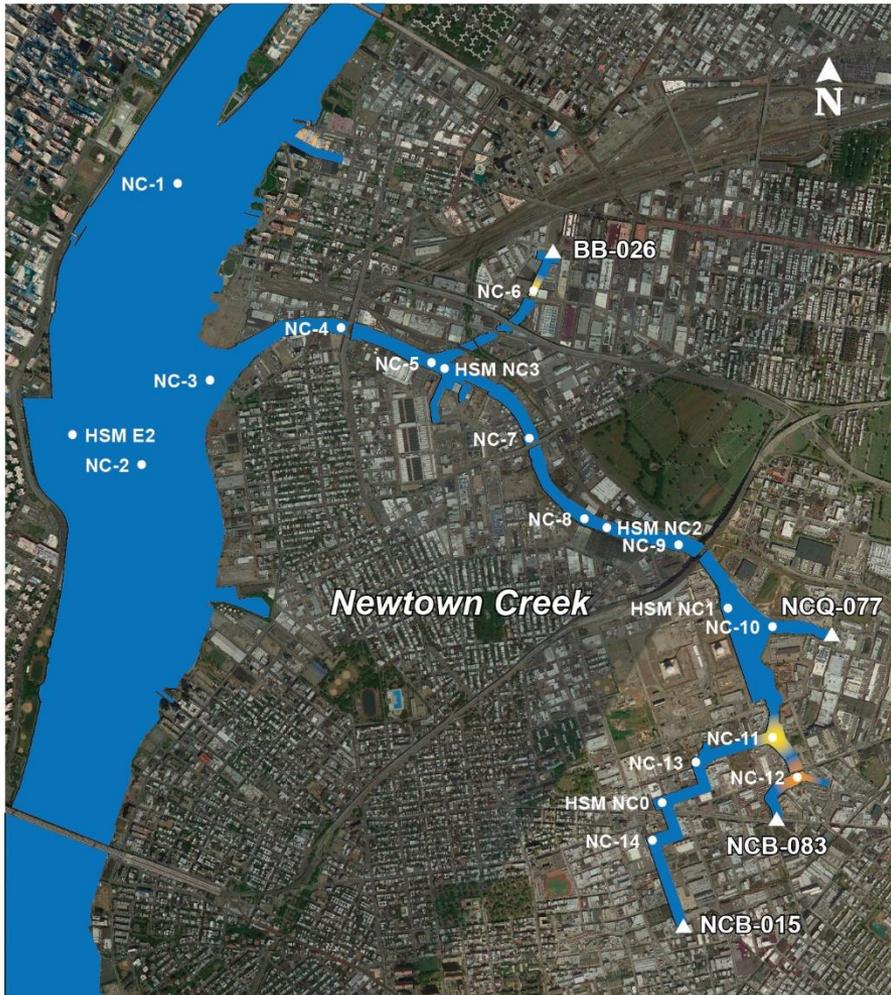
LTCP: ~6 Dry and ~44 Wet samples per location

HSM: ~10 Dry and ~32 Wet samples per location

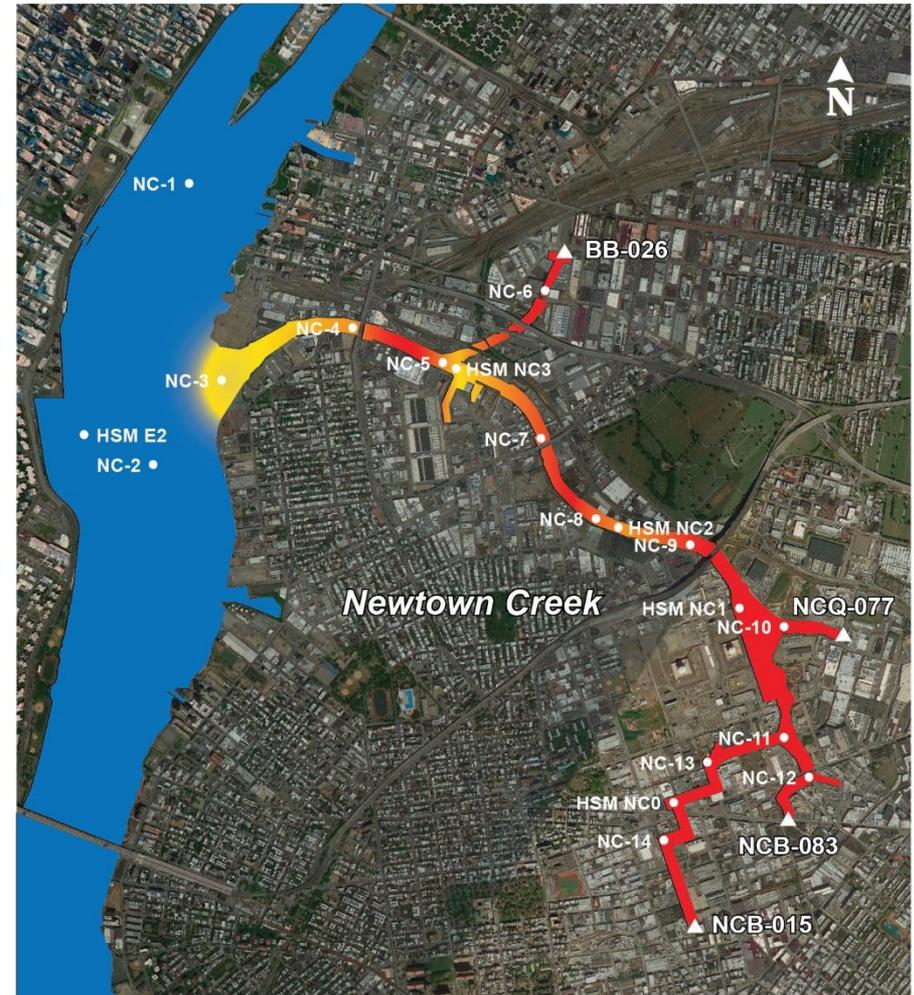
Scale (# col/100 mL)



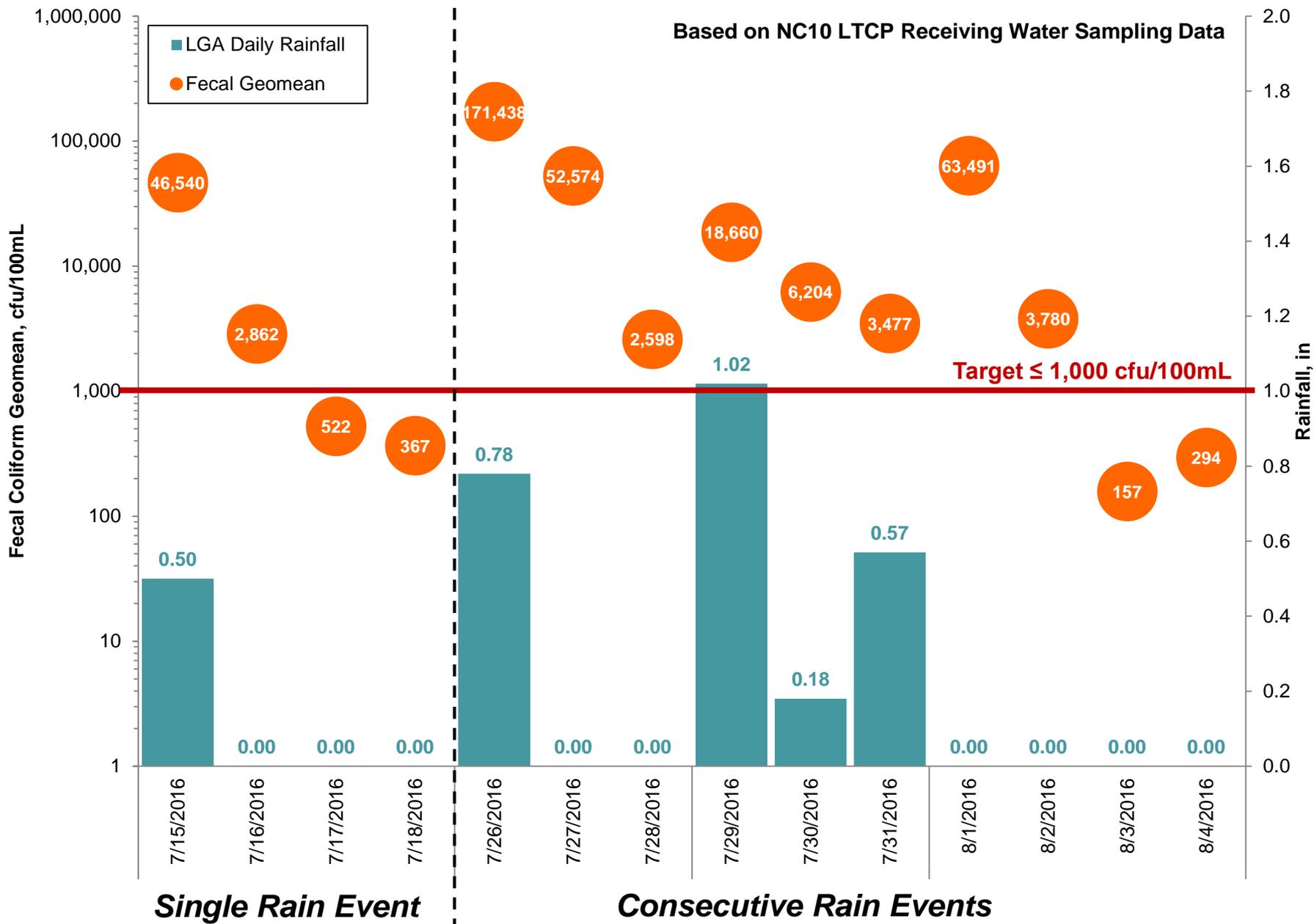
Dry Weather



Wet Weather



Fecal Coliform Recovery Over Time



Enterococci Sampling – Geometric Means

January 1, 2016 to September 30, 2016

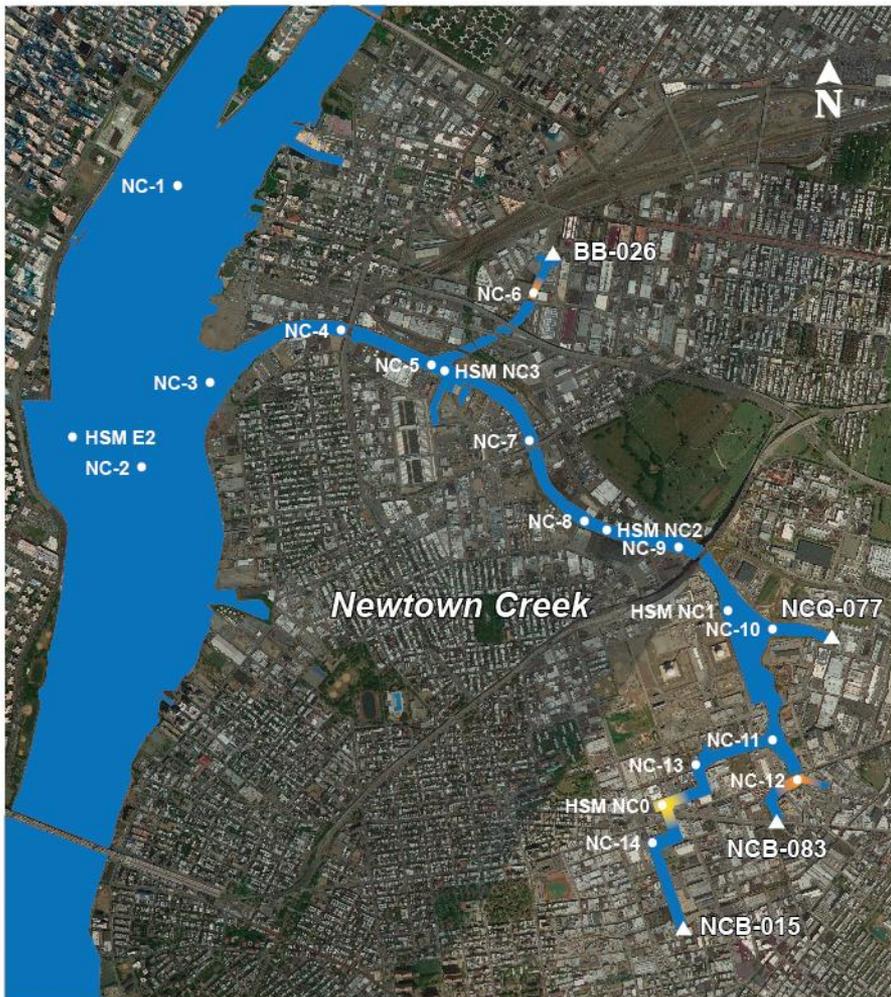
LTCP: ~6 Dry and ~44 Wet samples per location

HSM: ~10 Dry and ~32 Wet samples per location

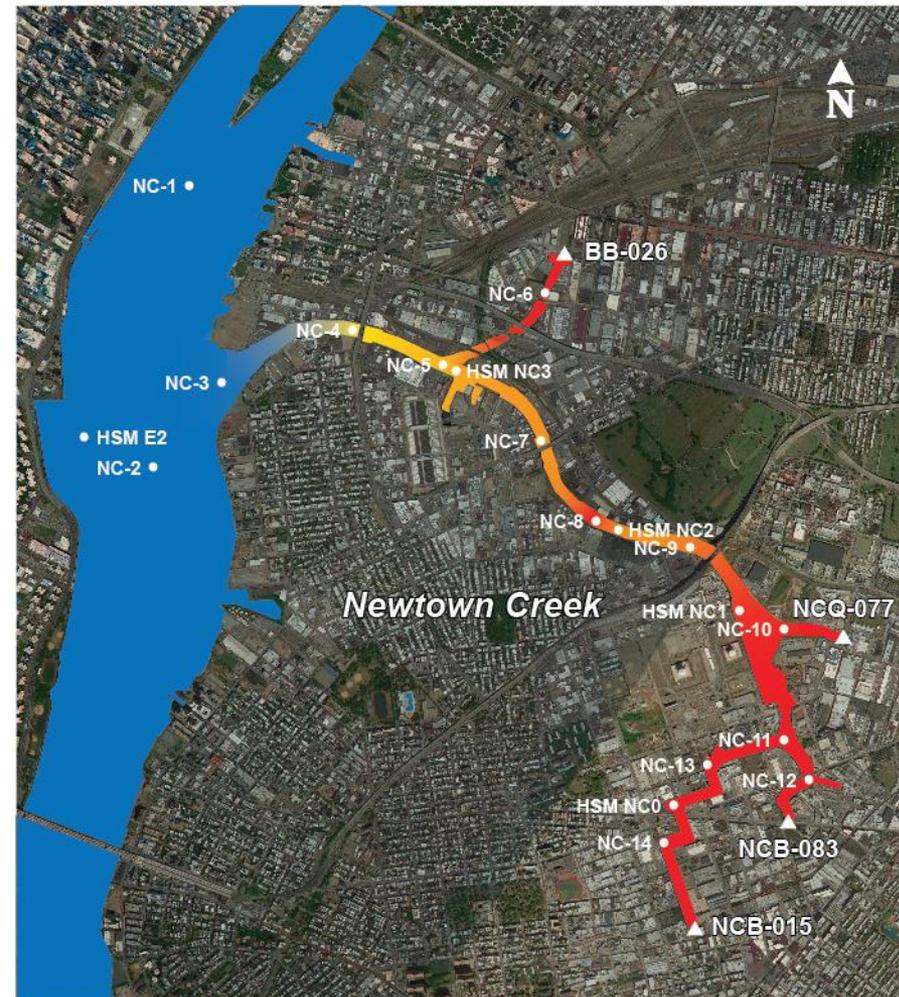
Scale (# col/100 mL)



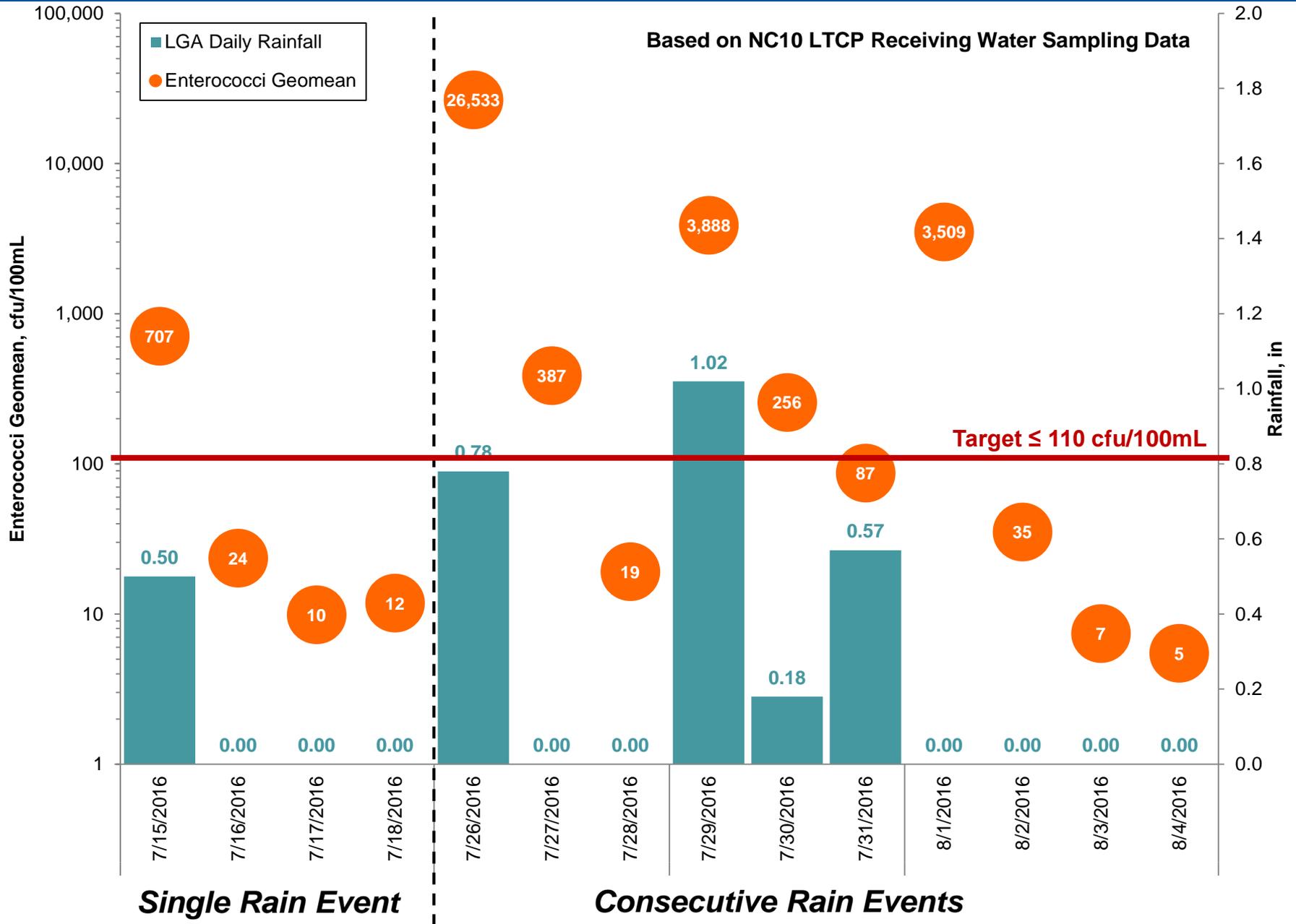
Dry Weather



Wet Weather



Enterococci Recovery Over Time



Dissolved Oxygen Sampling – 5th Percentile Values

January 1, 2016 to September 30, 2016

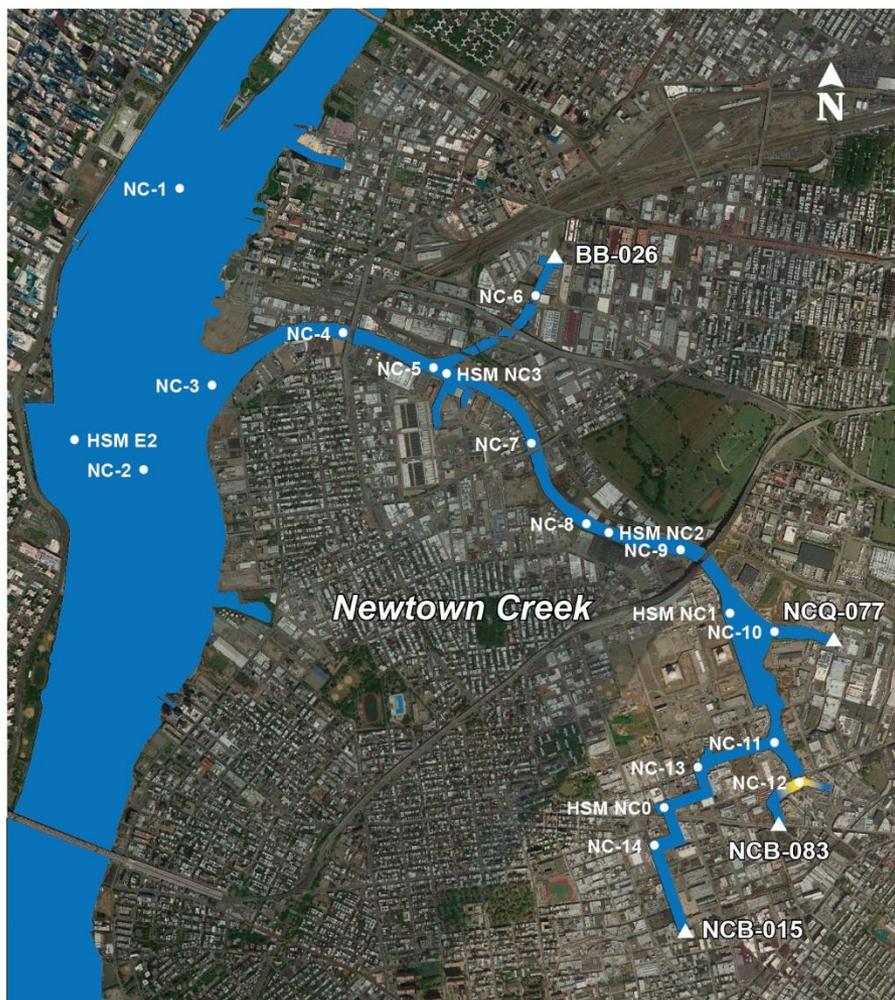
LTCP: ~6 Dry and ~38 Wet samples per location

HSM: ~10 Dry and ~32 Wet samples per location

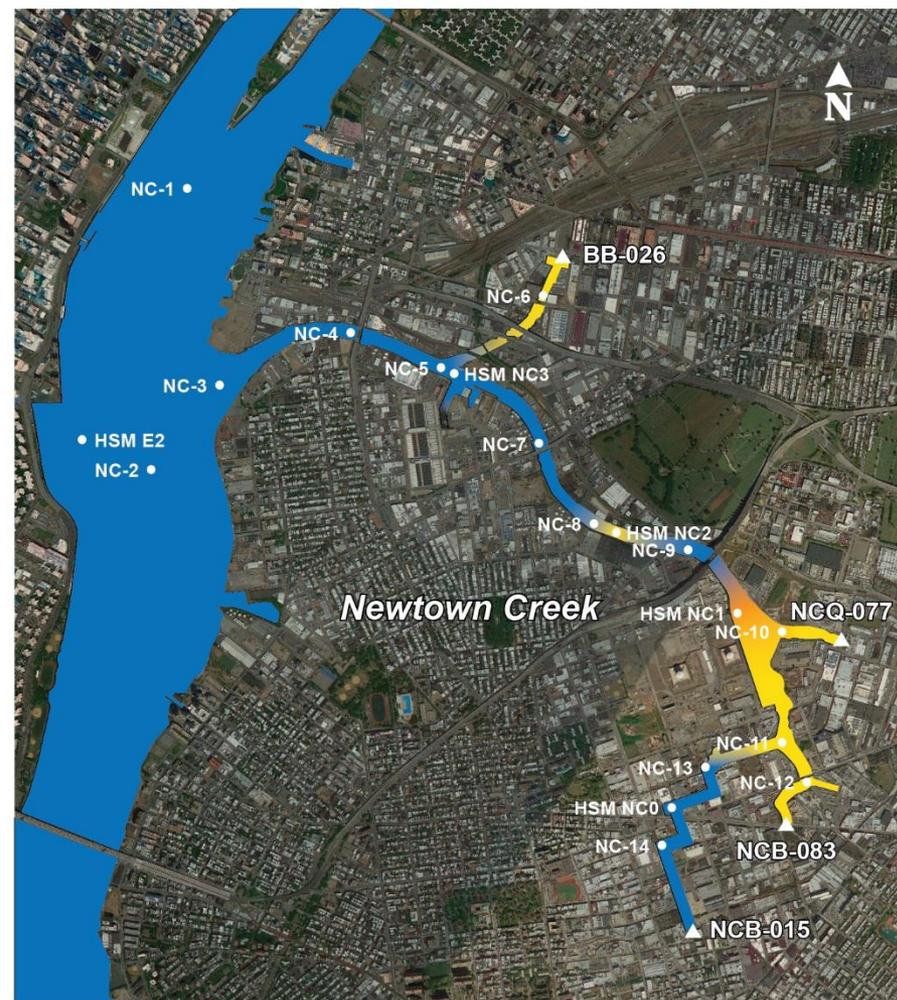
Scale (mg/L)



Dry Weather

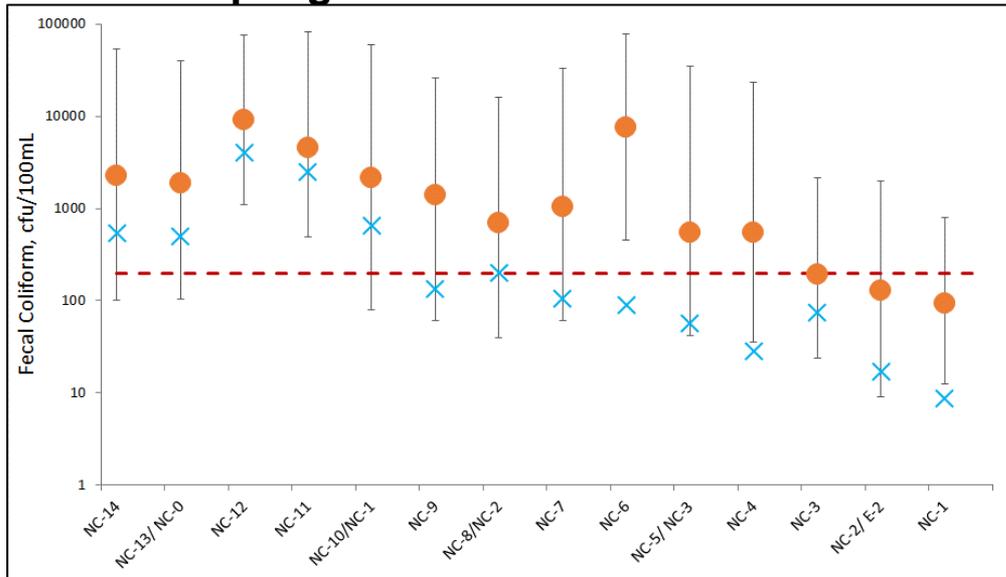


Wet Weather

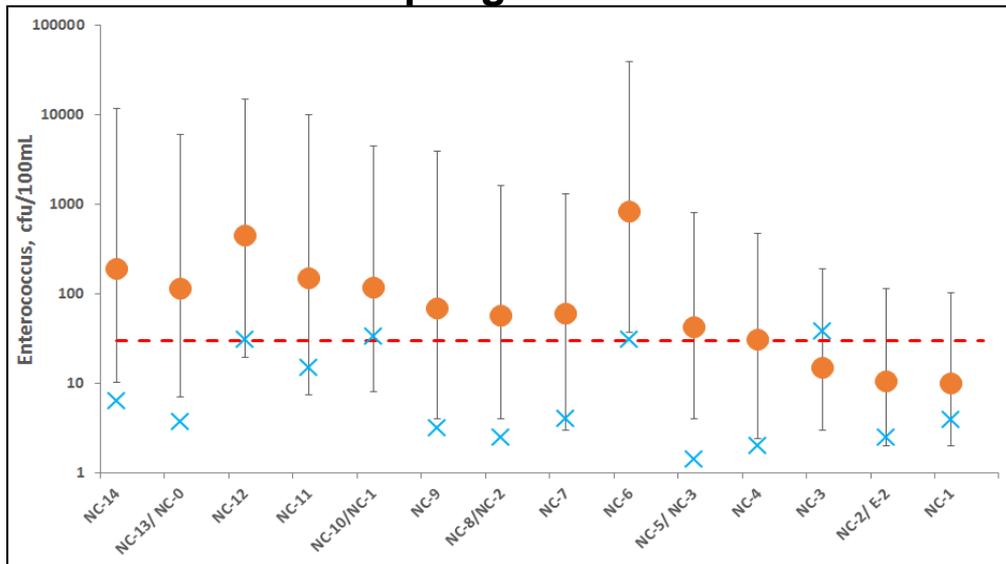


Canoe Excursion Sampling Results

Fecal Sampling Results:



Enterococcus Sampling Results:



- On July 20th, 2016, DEP joined the Newtown Creek Alliance for a canoe tour of Newtown Creek
- Sampling results from this excursion are within the ranges observed under the LTCP / HSM sampling programs

- GM of LTCP/HSM Sampling Results (1/1/16 – 9/30/16)
- ✕ Canoe Excursion Results (7/20/16) *Prior rainfall on 7/14 of 0.15-in
- Primary Contact Criteria
 - Fecal Monthly GM ≤ 200 cfu/100 mL
 - Entero 30-day Rolling GM ≤ 30 cfu/100 mL

Questions?

Water Quality Improvement Projects

Grey and Green Infrastructure

Keith Mahoney, P.E.

Director of Water Quality Planning
DEP – BEDC

Pinar Balci

Assistant Commissioner
DEP – BEPA

Recommended Project	Construction Cost	Status
1 Brooklyn/Queens Pump Station at Newtown Creek WWTP	\$300 M	Substantially Completed in 2013
2 Bending Weirs and Underflow Baffles	\$42 M	In-Construction thru 2017
3 In-Stream Aeration Projects (4)	\$60 M ¹	In-Construction thru 2020
4 Built and Planned GI Projects	\$45 M ²	Ongoing Design and Construction
Total = \$447 M		

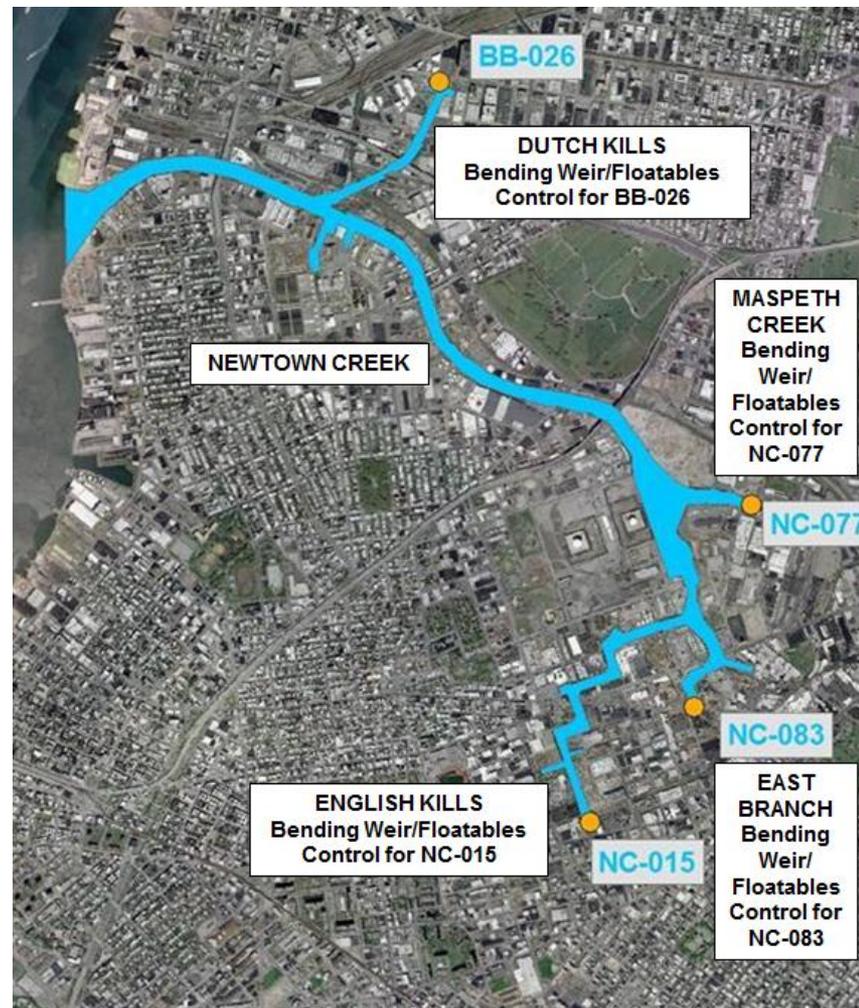
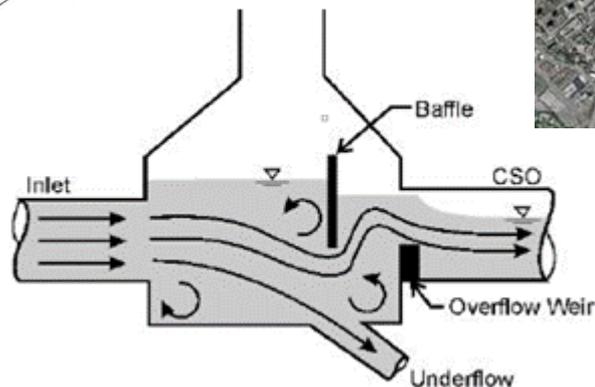
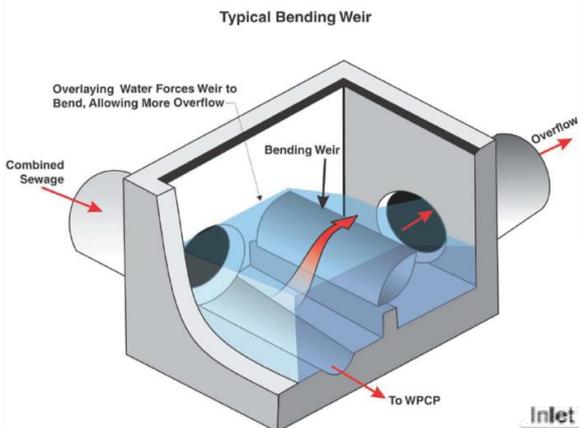
1) Cost pending for Maspeth Creek aeration.

2) Cost to date, more GI projects may be pending.

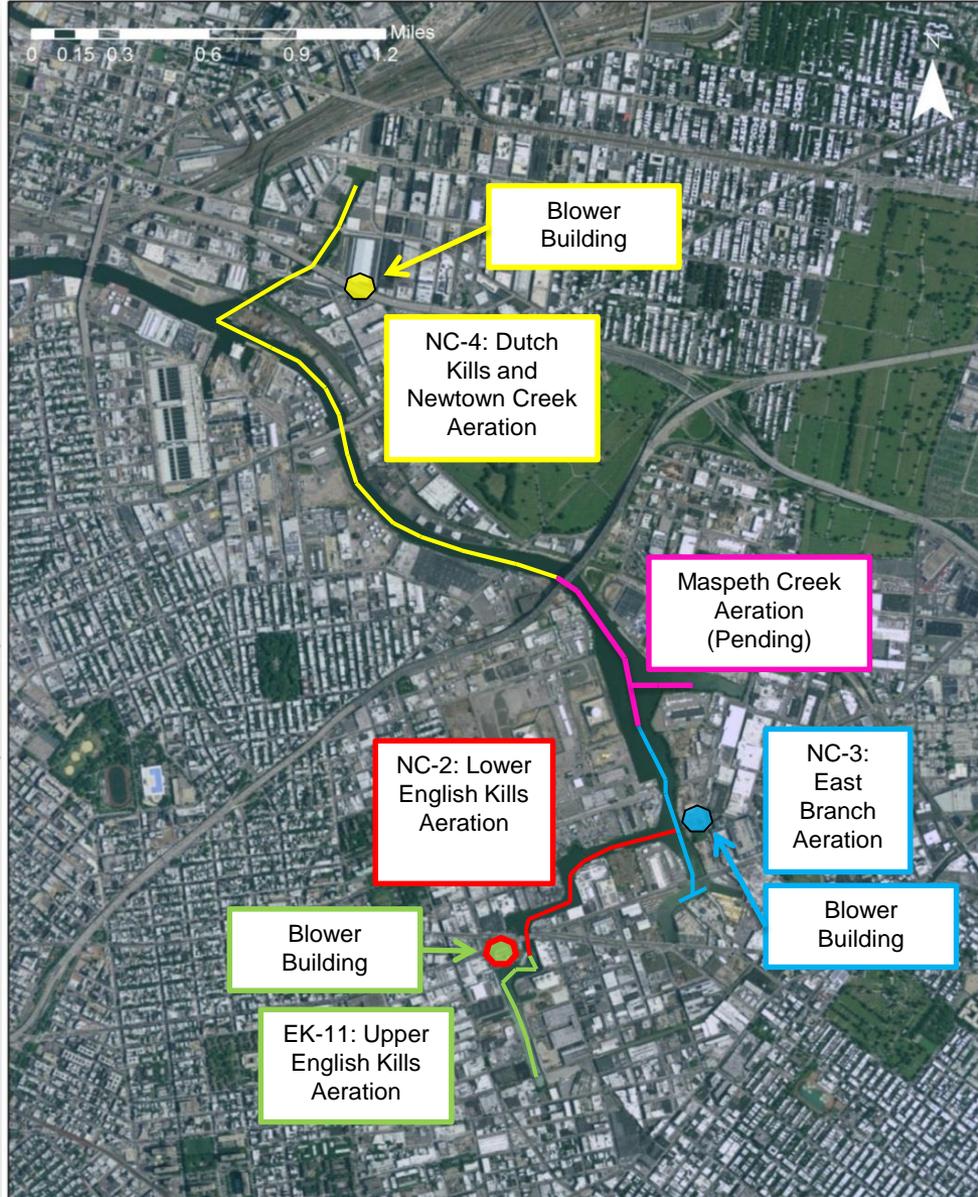
- Continued operation of the Brooklyn/Queens Pumping Station (PS) at NC WWTP
- PS Wet Weather Capacity = 400 MGD
- PS Upgraded in 2013: ~\$300 M
(includes 5 new MSPs, headworks upgrade, in-line storage facility, odor control)



- Construction Cost: \$42 M
- Construction Completion: Dec. 2017
- Volume Reduction: 62 MGY
- Provides Floatables Control
- Being installed at 4 locations (●):
 - B-01 (NCB-015), NCQ-01 (NCQ-077), NCB-2 (NCB-083), BB-L4 (BB-026)



3 In-Stream Aeration Projects



Note: Alignment of Proposed Aeration System is Approximate

Contract	Aeration Location	Construction Completion	Cost
EK-11	Upper English Kills	Dec. 2008	\$9.0 M
CSO-NC-2	Lower English Kills	Jan. 2014	\$2.2 M
CSO-NC-3	East Branch	Jun. 2018	\$18.0 M
CSO-NC-4	Dutch Kills and Newtown Creek	Dec. 2020	\$30.8 M
<i>Pending</i>	Maspeth Creek	Project on-hold pending results of clean-up operations in the Superfund area.	

- **Green Infrastructure (GI)** collects stormwater runoff from impervious surfaces, such as streets and roofs, reducing flow to sewers
- **\$1.5 billion** committed for GI Citywide to manage stormwater runoff from impervious combined sewer areas by 2030
- DEP will meet this goal through:
 - Area-Wide ROW Program
 - Public Property Retrofits
 - Grant Program for Private Property Owners
 - Detention Rule for New Development



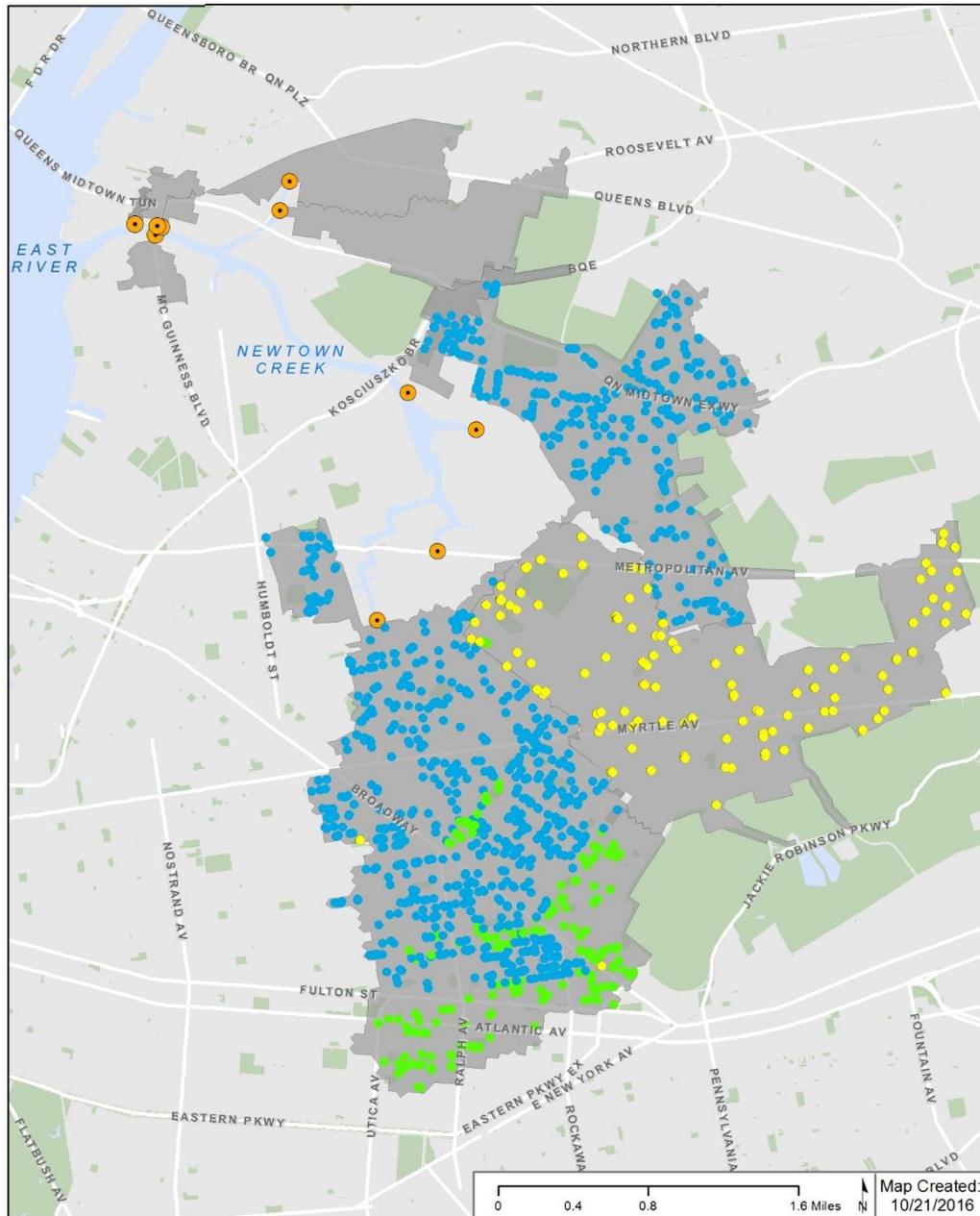
Rain Gardens



Permeable Pavers

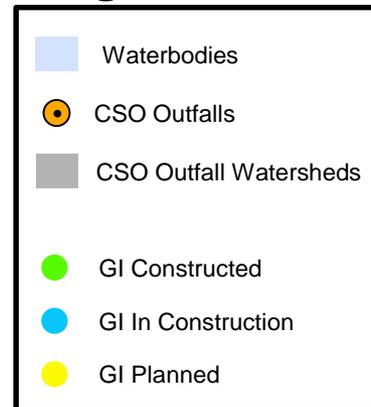


Green Roofs



- More than 1,300 GI assets within streets, parks, and schools built or planned
- 98% are ROW Rain Gardens (aka bioswales)
- Future GI include ROW Rain Gardens, schools, parks, and housing projects

Legend



Public Property Retrofits in Newtown Creek

Junior High School 162, 1390 Willoughby Ave, Bushwick



Before



After

Project Status	Parks/ Playgrounds	Public Schoolyards	NYCHA Housing Developments	Total
Potential	1	0	3	4
Preliminary	12	6	6	24
Schematic	4	2	0	6
Constructed	0	2	1	3
Total	17	10	10	37

➤ **Green Infrastructure Grant Program:**

DEP provides funding for the design and construction costs of green infrastructure on private property in combined sewer areas of the City.

➤ **Green Roof Tax Abatement:**

The City provides a one-year property tax abatement for private properties that install green roofs. The abatement value is \$5.23 per square foot (up to the lesser of \$200,000 or the building's tax liability) and is available through March 15, 2018.

➤ **2012 Stormwater Rule:**

In 2012, DEP amended the allowable flow rate of stormwater to the City's combined sewer system for new and existing development. Site Connection Proposals may include green infrastructure technologies to meet the new allowable rate.

➤ **New Private Incentive Program:**

DEP is currently developing a new private property green infrastructure retrofit initiative to augment its current efforts on stormwater management on private property. An RFI was released on 9/19 in which DEP sought ideas on innovative program management structures for this new initiative.

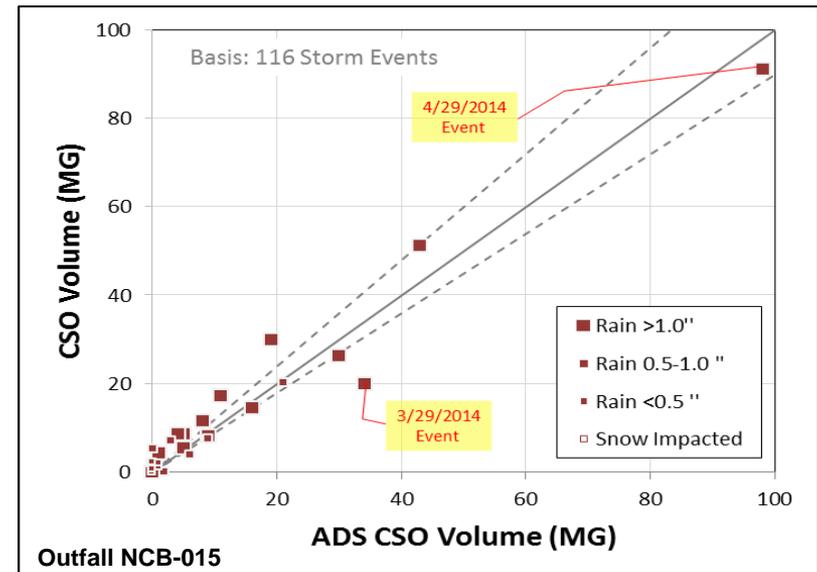
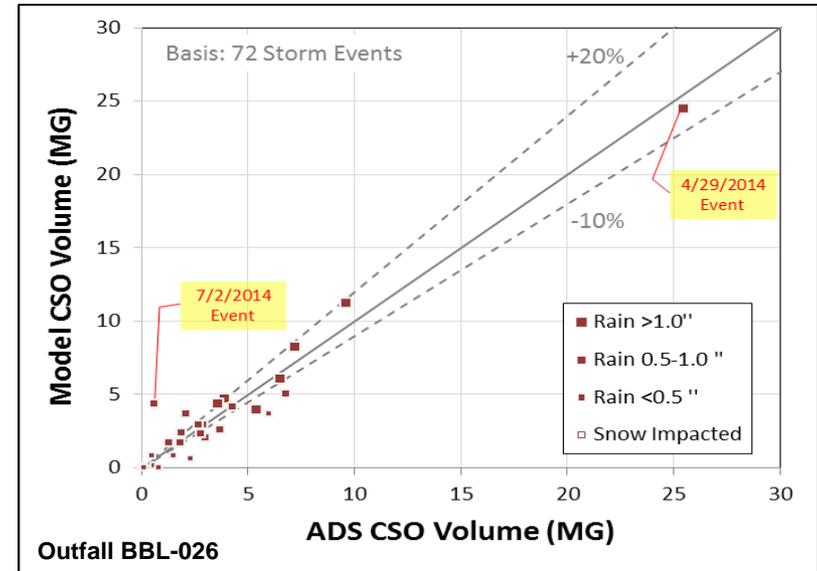
Questions?

LTCP Modeling and Alternatives Development Process

Keith Mahoney, P.E.
Director of Water Quality Planning
DEP – BEDC

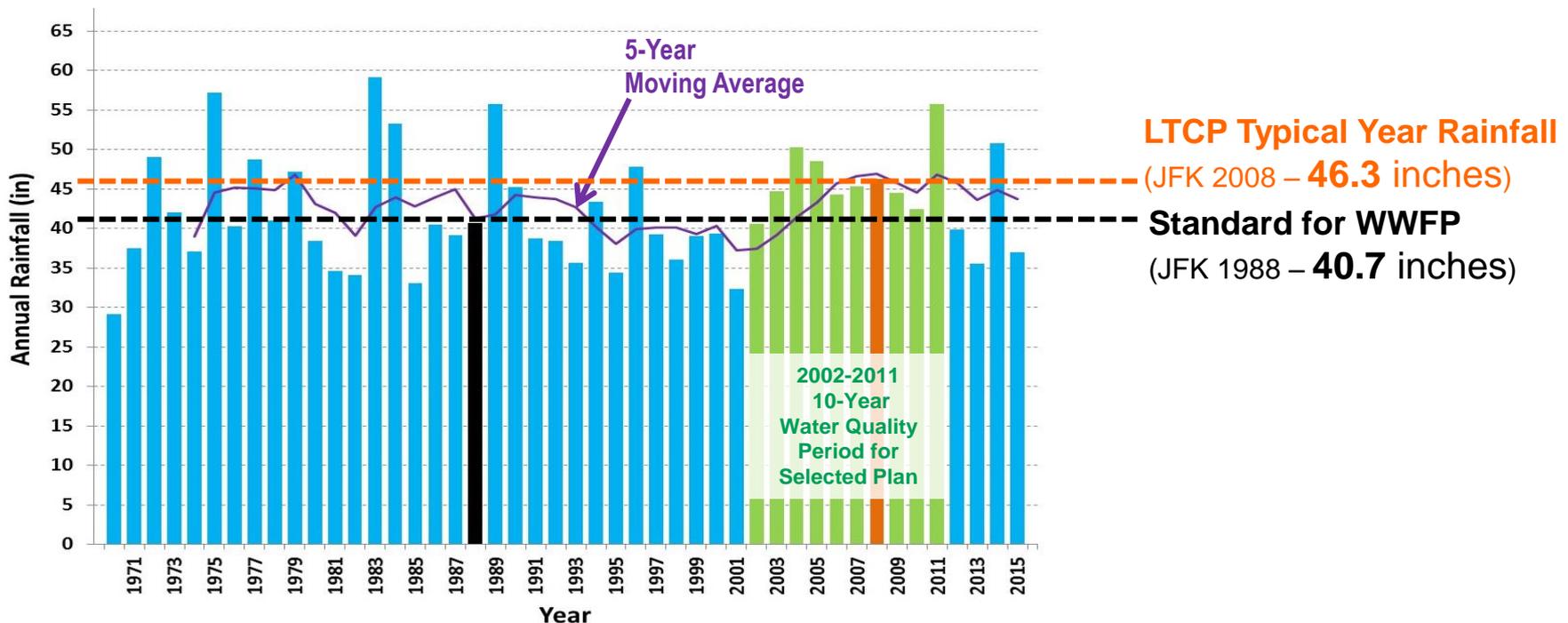
Newtown Creek Landside Model Calibration

- DEP's process for flow monitoring and modeling has been **nationally peer reviewed and published**
- DEP implemented that process to update and validate its Newtown Creek sewer system model based upon:
 - Field surveys and record drawings of physical structures.
 - A validation dataset based upon a **12-month** sewer-monitoring program and extensive data analyses.
 - Data was analyzed using WaPUG approved methodologies and showed very good correlation.

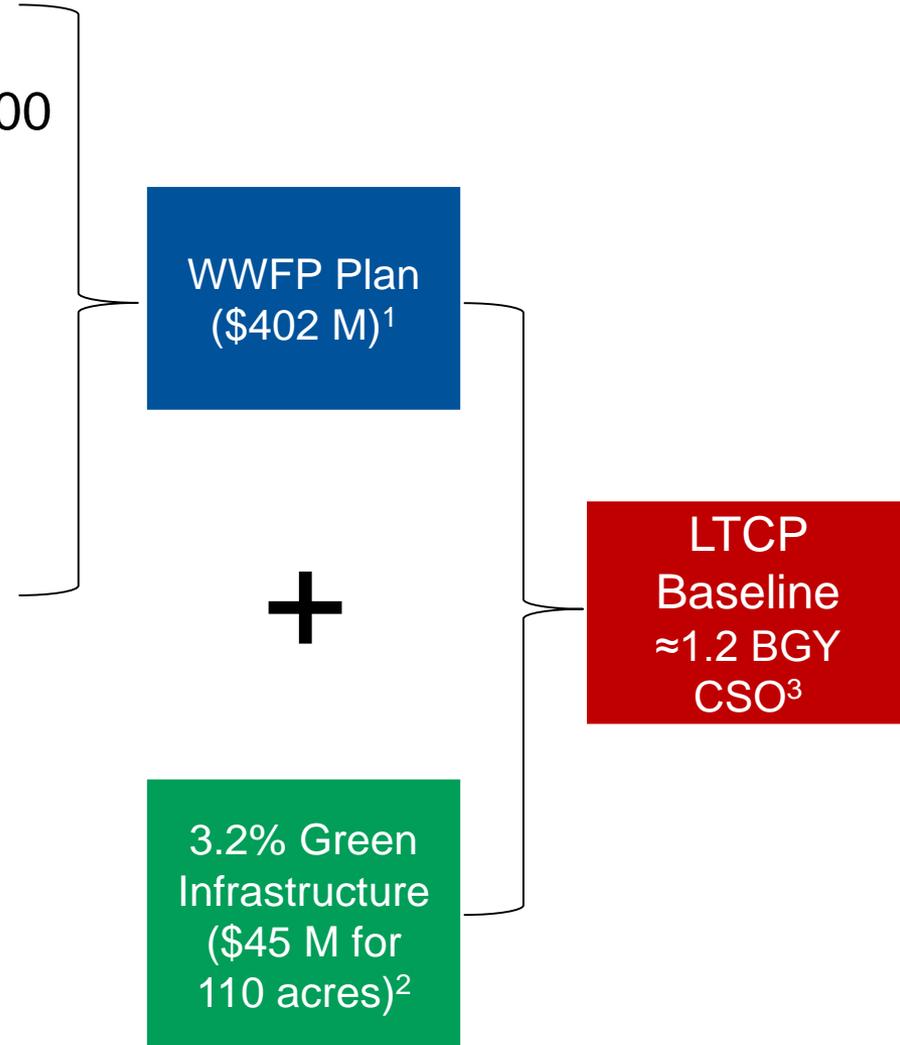


Model Calibration Inputs and Assumptions

- **Landside Model** calibrated based on flow monitoring data, gauge adjusted radar rainfall data, and satellite flyover impervious data
- **Water Quality Model** calibrated with Harbor Survey and LTCP sampling data
- Calibrated modeling inputs and assumptions include:
 - Committed CSO and BNR projects
 - 2040 sanitary flows and loads
 - JFK 2008 “Typical Year Rainfall” for Alternative Analysis
 - JFK 10-yr data (2001 to 2011) for baseline and selected alternatives



- 1 Continued operation of Brooklyn / Queens PS at NC WWTP at up to 400 MGD during wet weather
- 2 Construction of Bending Weirs and Underflow Baffles at 4 Locations
- 3 Construction of In-Stream Aeration
- 4 Committed Green Infrastructure in Newtown Creek watershed



1) Cost pending for Maspeth Creek aeration.
2) Cost to date, more GI projects may be pending.
3) Preliminary estimate.

1. Bacteria Source Component Analysis

- CSO, stormwater and direct drainage

2. Gap Analysis for Water Quality Standard (WQS) Attainment

- Calculate bacteria and dissolved oxygen for:
 - Baseline Conditions
 - 100% CSO Control Conditions

3. Assess Levels of CSO Control Necessary to Achieve WQS

4. Identify Technologies to Cost-Effectively Achieve the Required Level of CSO Control



Sample Technologies:

- **Storage**
- **Treatment**
- **System Optimization**
- **Source Control**

CSO Mitigation Toolbox

INCREASING COMPLEXITY 

INCREASING COST 

Source Control	Existing GI	Additional GI	High Level Sewer Separation		
System Optimization	Fixed Weir	Parallel Interceptor / Sewer	Bending Weirs Control Gates	Pump Station Optimization	Pump Station Expansion
CSO Relocation	Gravity Flow Tipping to Other Watersheds	Pumping Station Modification	Flow Tipping with Conduit/Tunnel and Pumping		
Water Quality / Ecological Enhancement	Floatables Control	Environmental Dredging	Mechanical Aeration	Flushing Tunnel	
Treatment Satellite:	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)	
Centralized:	WWTP Expansion				
Storage	In-System	Shaft	Tank	Tunnel	

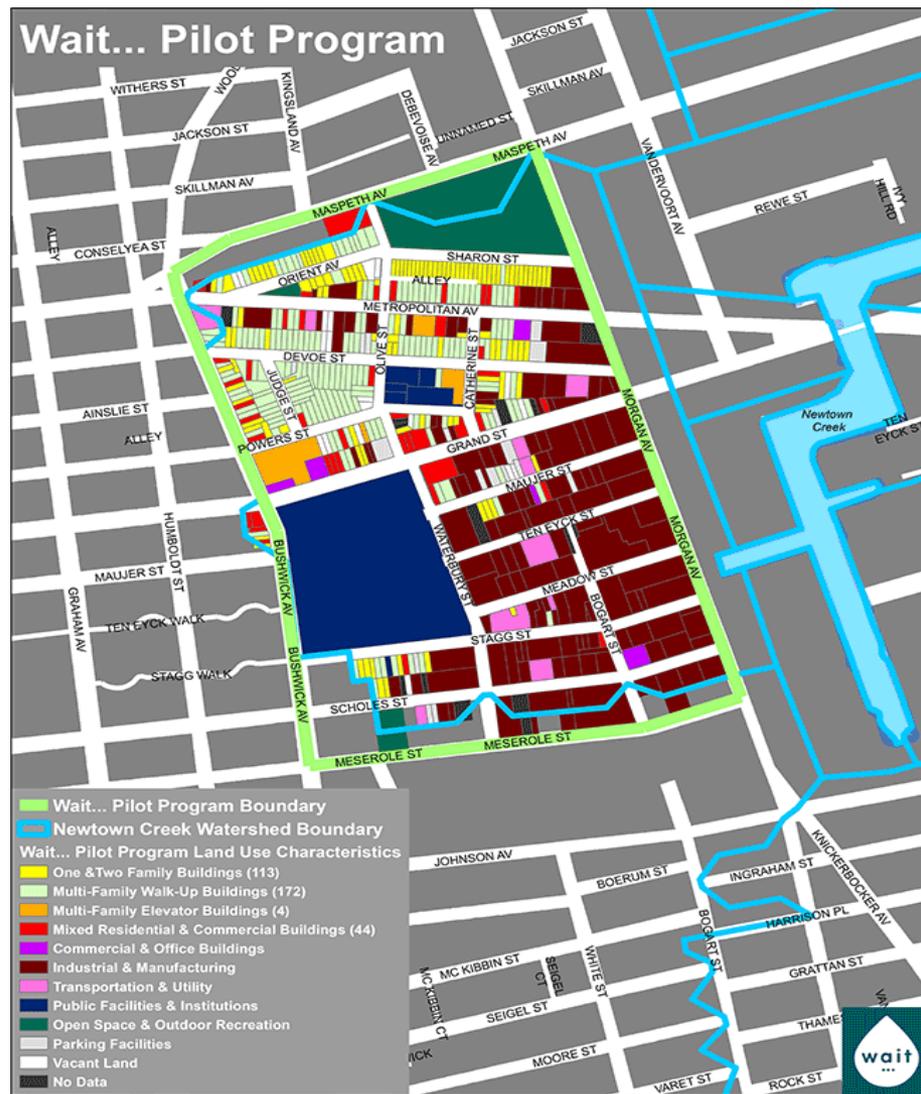
 Completed or underway per Waterbody / Watershed Facility Plan (WWFP)

Questions?

How *You* Can Help & Next Steps

Mikelle Adgate
Director of Stormwater Outreach
DEP – BPA

- Water quality program that encourages residential participants to **postpone typical household water uses** (i.e, laundry, dishwashing, etc.) **during heavy storm**
- **Text 38671** with **wait-nycdep** start to join



Wait... Pilot Program

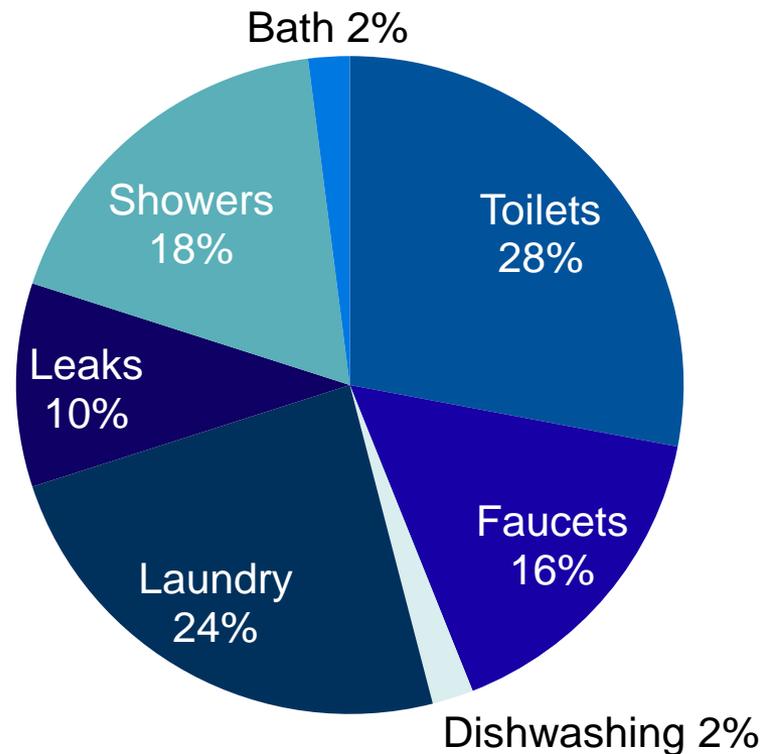


- Wait... is a water quality improvement pilot program that encourages residential participants to voluntarily postpone water use during combined sewer overflow (CSO) events
- Goal: increase capacity in combined sewer system during large storm events and reduce concentration of wastewater in CSOs

- Target: residential water uses individuals can choose to delay

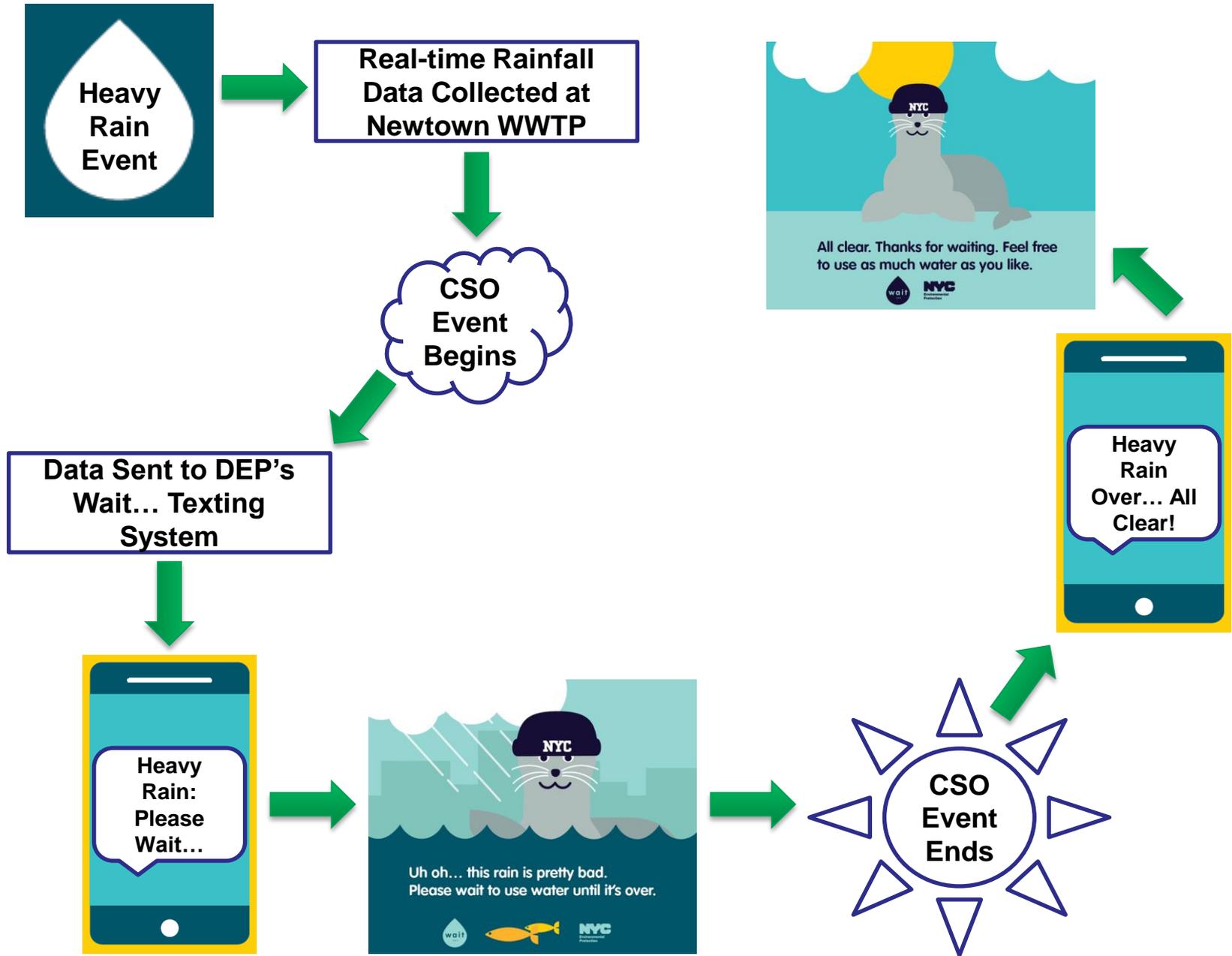
- DEP is first water utility in US to pilot this type of behavior modification program

- Technical, creative and outreach components



Indoor water use in a typical single-family home

Wait... Pilot Program – How it Works



Wait... Pilot Program – Preliminary Results

- Pilot monitoring phase: June 6 to November 30, 2016
- Number of pilot participants in Newtown Creek sewershed: 379
- Water consumption used as metric: if participants use less water during a CSO event, compared to what they normally use (baseline consumption), they “waited”
- Number of CSO events to date: 7
 - Participants “waited” 4 out of 5 CSO events; analysis pending for 2 events

Wait... Pilot Program Preliminary Results and Data		
CSO Event	Percent Change from Baseline Consumption	
#1	5% reduction	
#2	2% reduction	
#3	2% increase	
#4	7% reduction	
#5	10% reduction	
#6	<i>Data/Analysis Pending</i>	
#7	<i>Data/Analysis Pending</i>	

Questions?

- Newtown Creek LTCP Public Meeting #2, Spring 2017
 - LTCP Submittal to NYS DEC in June 2017

- Public Comments will be accepted through **Dec. 30, 2016**
 - There will be subsequent comment periods following the alternative and final plan review meetings.

- Comments can be submitted to:
 - New York City DEP at: ltcp@dep.nyc.gov

- Visit the informational tables tonight for handouts and poster boards with detailed information

- Go to www.nyc.gov/dep/ltcp to access:
 - LTCP Public Participation Plan
 - Presentation, handouts and poster boards from this meeting
 - Links to Waterbody/Watershed Facility Plans
 - CSO Order including LTCP Goal Statement
 - NYC's Green Infrastructure Plan
 - Green Infrastructure Pilots 2011 and 2012 Monitoring Results
 - NYC Waterbody Advisory Program
 - Upcoming meeting announcements
 - Other LTCP updates