Environmental Protection

Citywide/Open Waters

CSO Long Term Control Plan

Public Kickoff Meeting

East River & Long Island Sound

Newtown Creek WWTP Visitor Center

May 10, 2018

Agenda

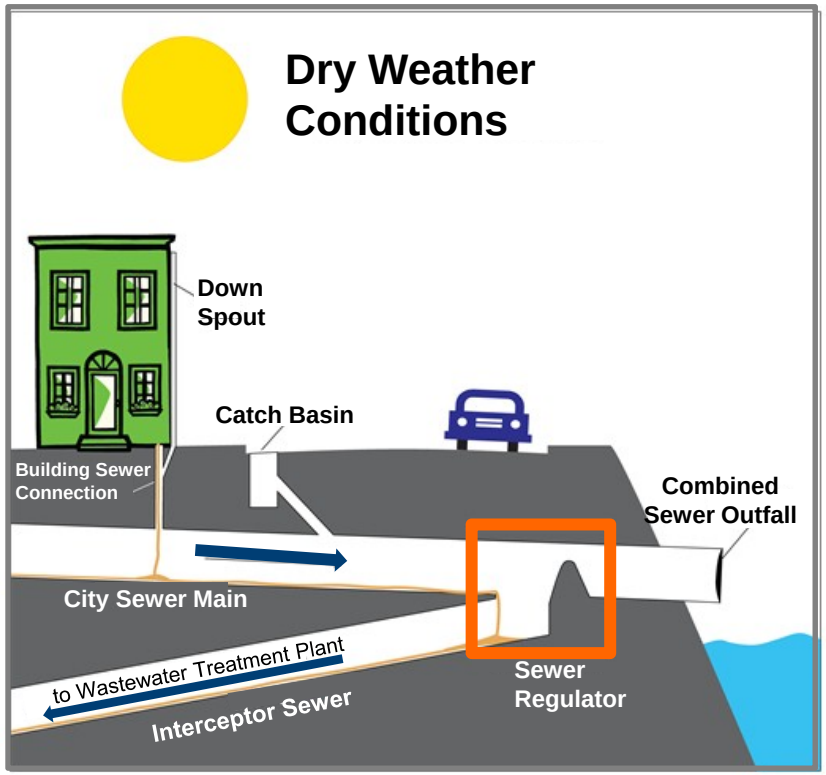
	Topic	Speaker
1	**Welcome & Introduction**	Mikelle Adgate
2	**Waterbody & Watershed Characteristics and Water Quality Sampling**	Keith Mahoney
3	**Water Quality Improvement Projects**	
	• Grey Infrastructure	Keith Mahoney
	• Green Infrastructure	Melissa Enoch
4	**LTCP Modeling & Alternative Development Process**	Keith Mahoney
5	**Next Steps**	Mikelle Adgate
6	**Discussion and Q&A Session**	All

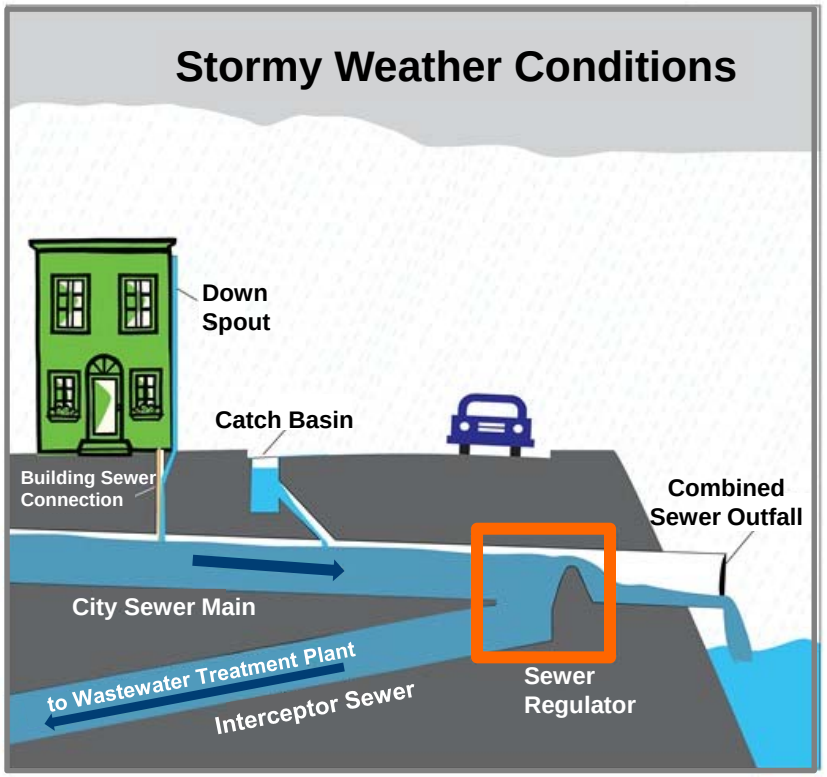
Welcome & Introduction

Mikelle Adgate
Senior Policy Advisor
DEP

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**.





- When the sewer system is at full capacity, a mixture of rain water and sewage may be released into local waterways. This is called a combined sewer overflow (CSO).

How does rainfall affect CSOs?

- **Not every rainfall causes a CSO event:**
  - Approximately 33% of the average rainfall events per year may trigger a CSO at East River and Long Island Sound

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

What is a LTCP and CSO Consent Order?

Long Term Control Plan (LTCP)

identifies appropriate CSO controls to achieve applicable water quality standards

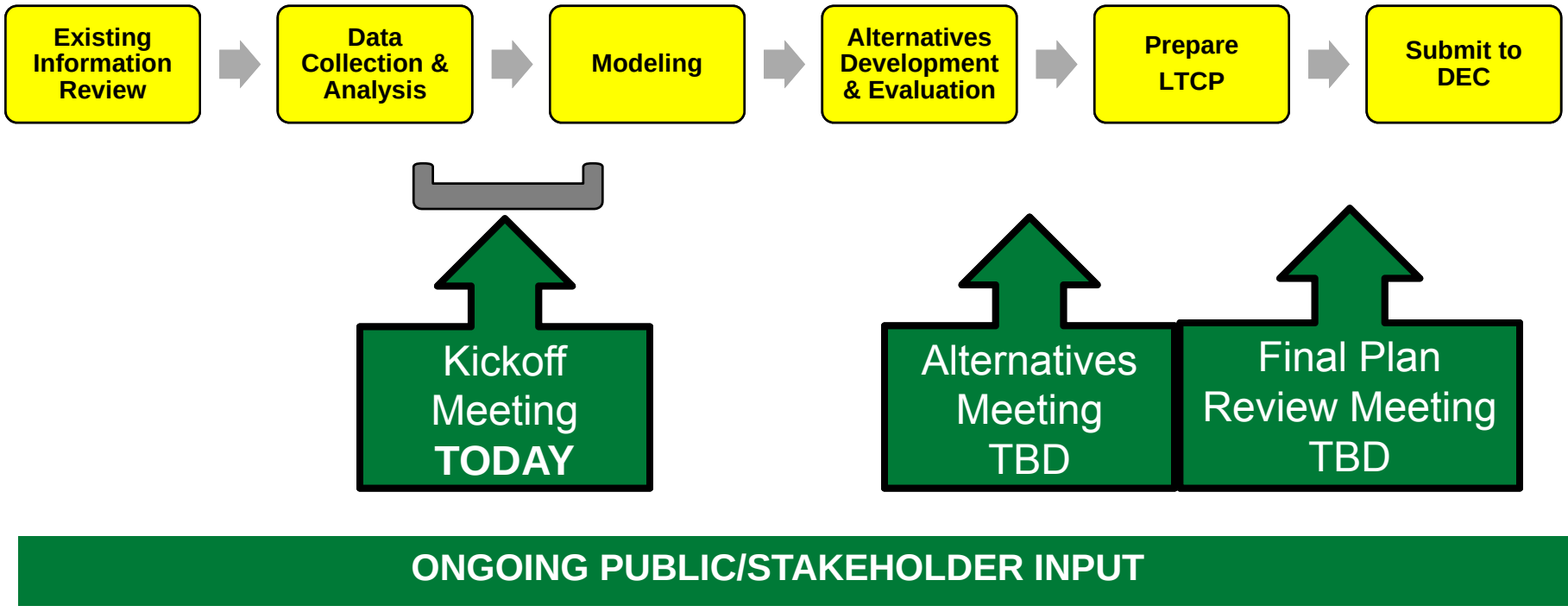
consistent with the Federal CSO Policy and Clean Water Act

CSO Consent Order

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

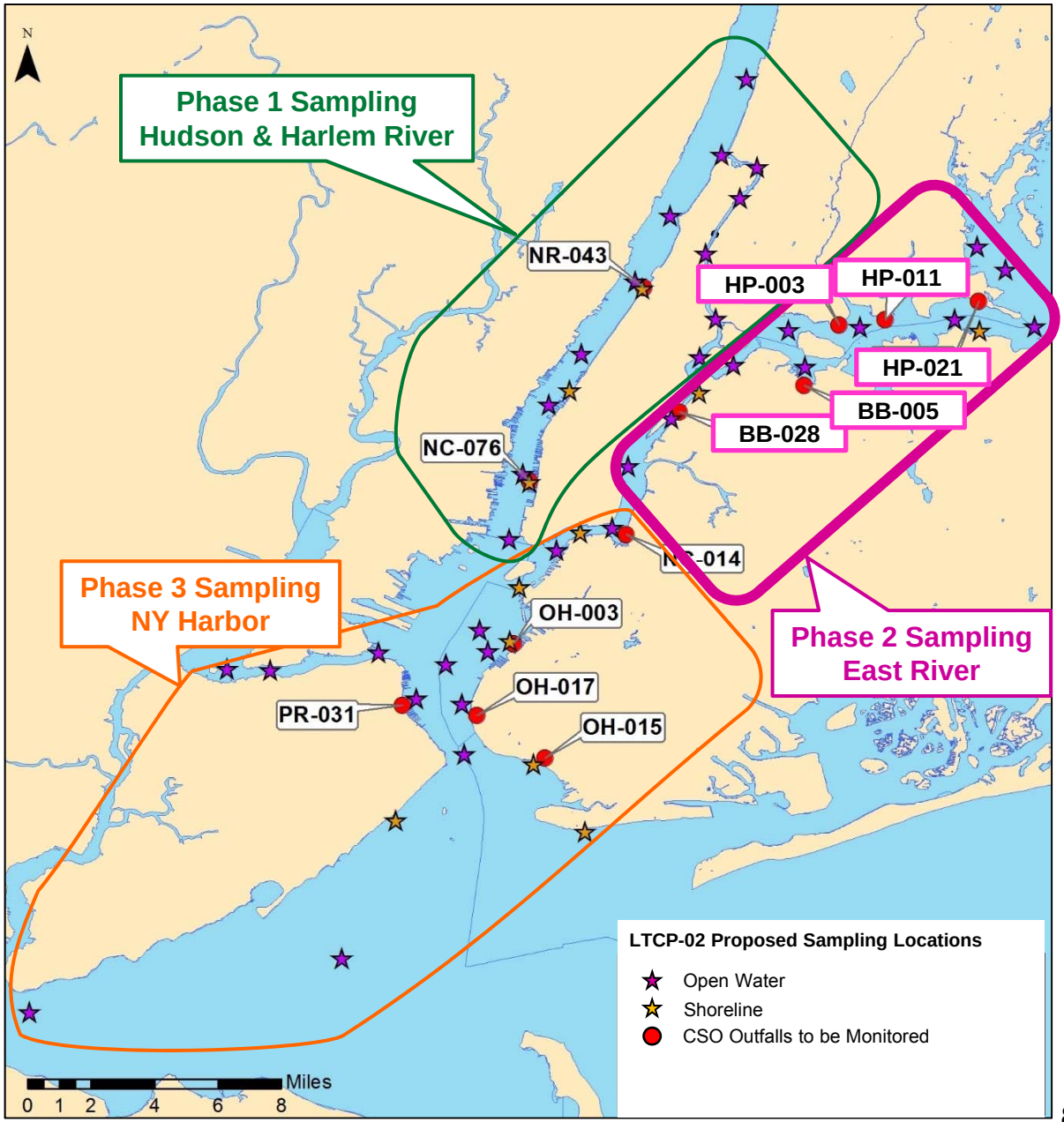
DEC requires DEP to develop LTCPs and mitigate CSOs

LTCP Process and Public Involvement



East River & LIS in Phase 2 Sampling

- The Citywide/Open Waters Sampling Program was divided into 3 Phases
- East River and Long Island Sound (LIS) were covered under Phase 2

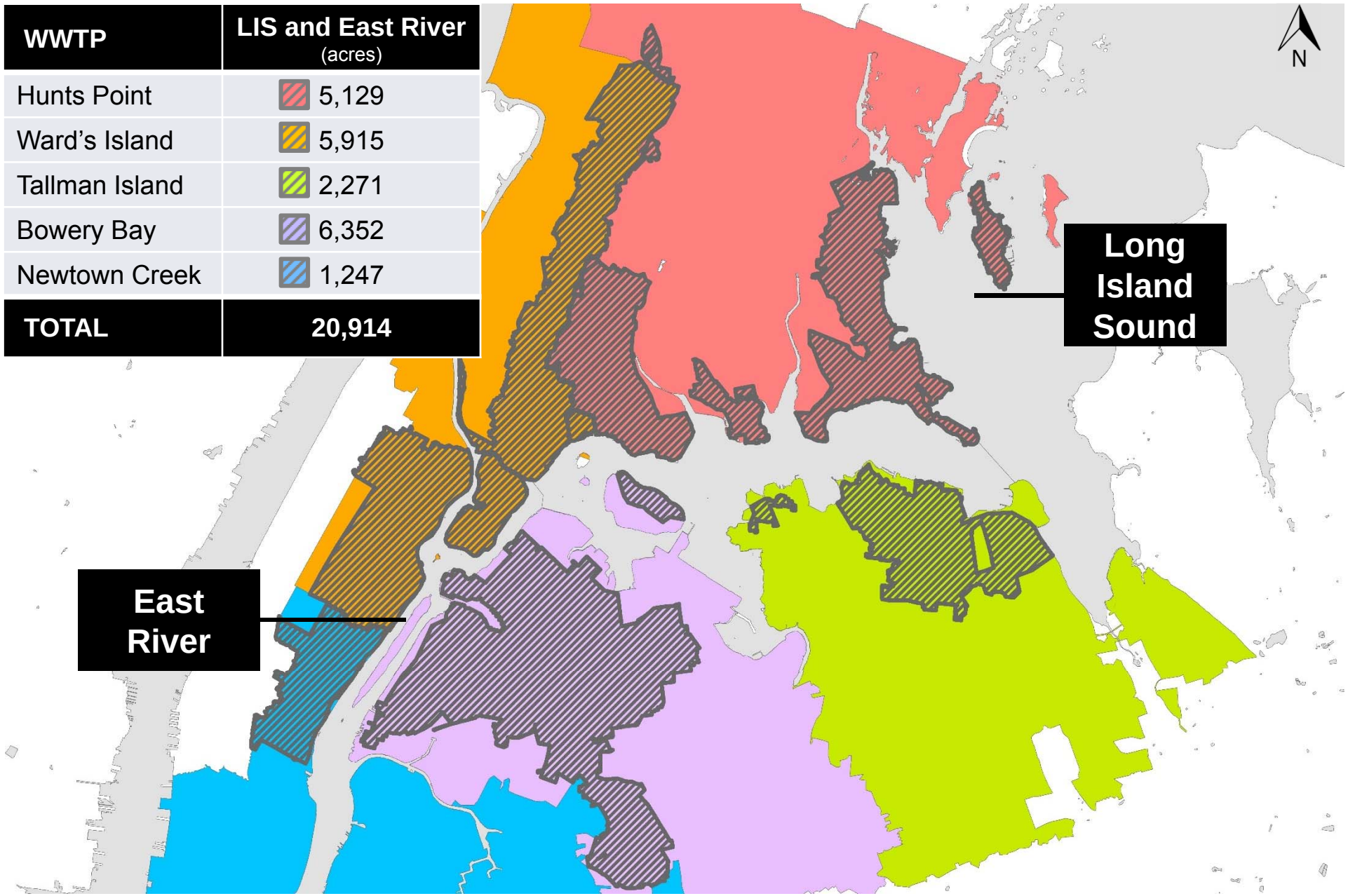


Waterbody & Watershed Characteristics and Water Quality Sampling

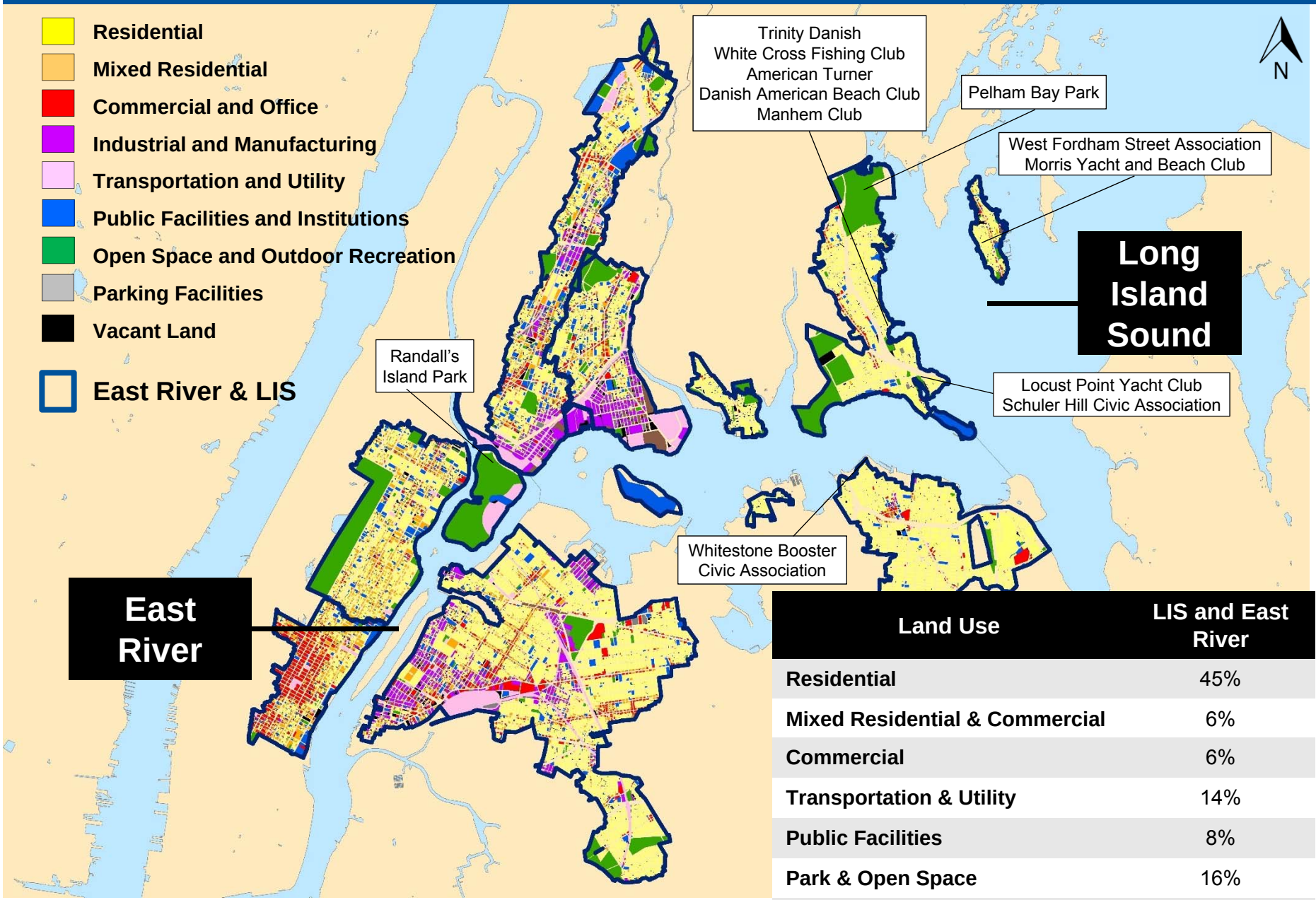
Keith Mahoney, PE
Director of Water Quality Planning
DEP

Combined Sewer Drainage Areas to East River/LIS

WWTP	LIS and East River (acres)
Hunts Point	5,129
Ward's Island	5,915
Tallman Island	2,271
Bowery Bay	6,352
Newtown Creek	1,247
TOTAL	**20,914**

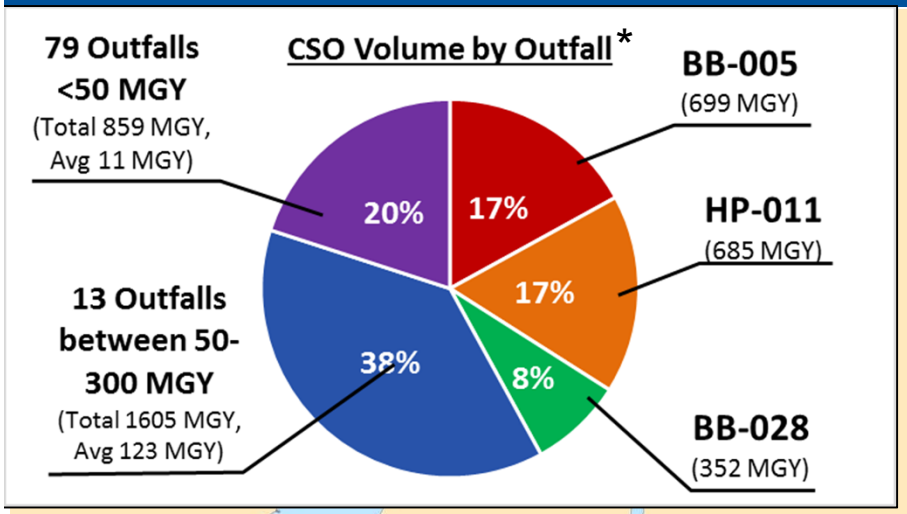


Land Use for East River/LIS



Land Use	LIS and East River
Residential	45%
Mixed Residential & Commercial	6%
Commercial	6%
Transportation & Utility	14%
Public Facilities	8%
Park & Open Space	16%
Other	5%

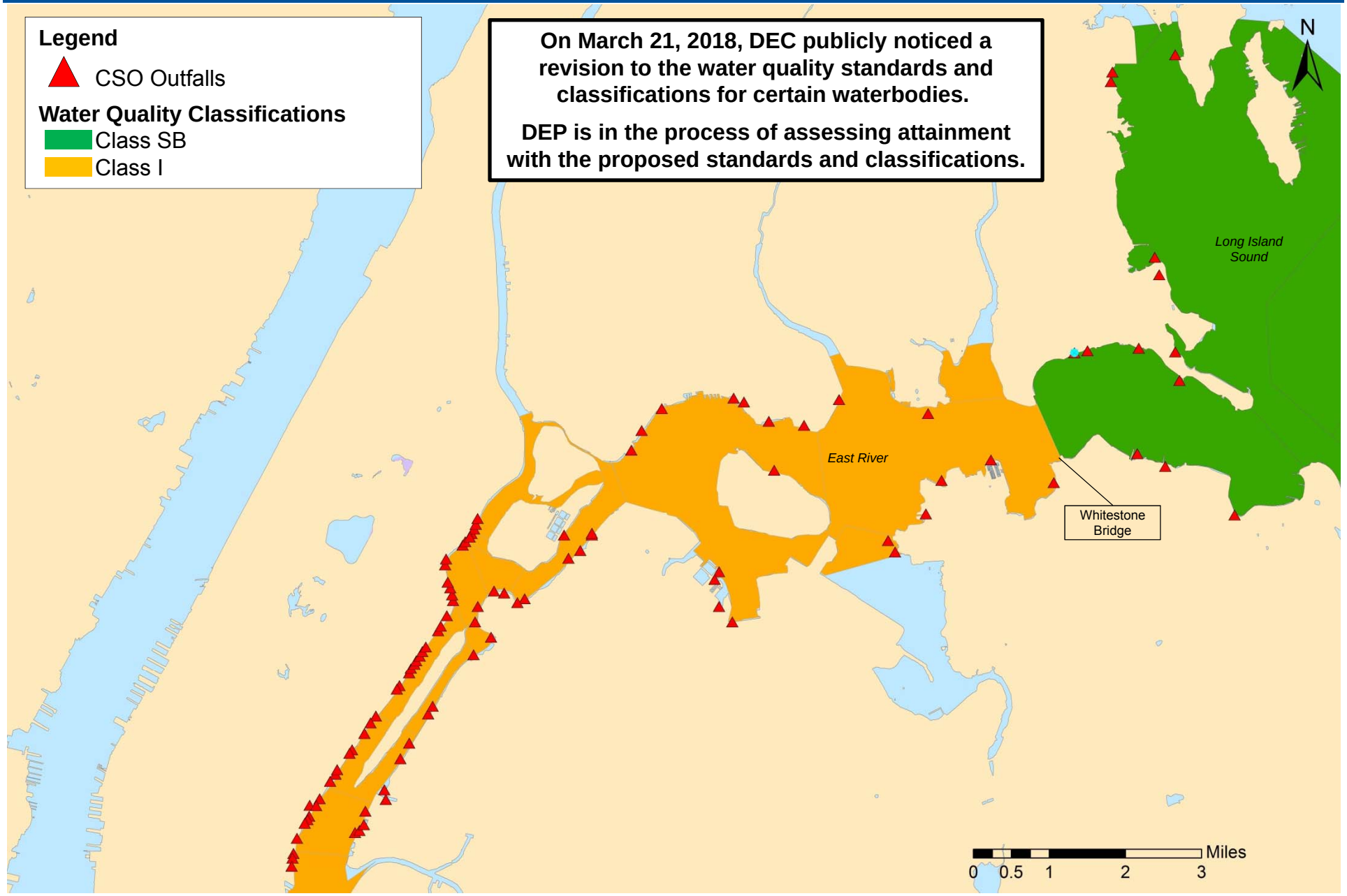
East River & LIS Outfalls



*Preliminary results based on baseline conditions

(1) Includes direct drainage and other non-DEP stormwater
(2) Preliminary results based on existing conditions

East River & LIS Overview



Water Quality Standards and LTCP Goals

CLASS SB
Bathing

The **best usage** of Class SB water are **primary and secondary contact** recreation and fishing. These waters shall be suitable for fish, shellfish and wildlife propagation and survival.

CLASS I
Boating/Fishing

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

Location	Class	Dissolved Oxygen* (mg/L)	Fecal Coliform** (col/100 mL)	Total Coliform** (col/100 mL)
East River and Long Island Sound (East of Bronx-Whitestone Bridge)	**SB**	≥ 4.8 (daily average) ≥ 3.0 (acute, never less than)	Monthly Geometric Mean ≤ 200	Monthly Median ≤ 2,400 and 80% ≤ 5,000
East River (West of Bronx-Whitestone Bridge)	**I**	≥ 4.0 (acute, never less than)		

**(NYCRR Part 703.3)*
***(NYCRR Part 703.4)*

CSO LTCP Goals and Targets:

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

On March 21, 2018, DEC publicly noticed a revision to the water quality standards and classifications for certain waterbodies.

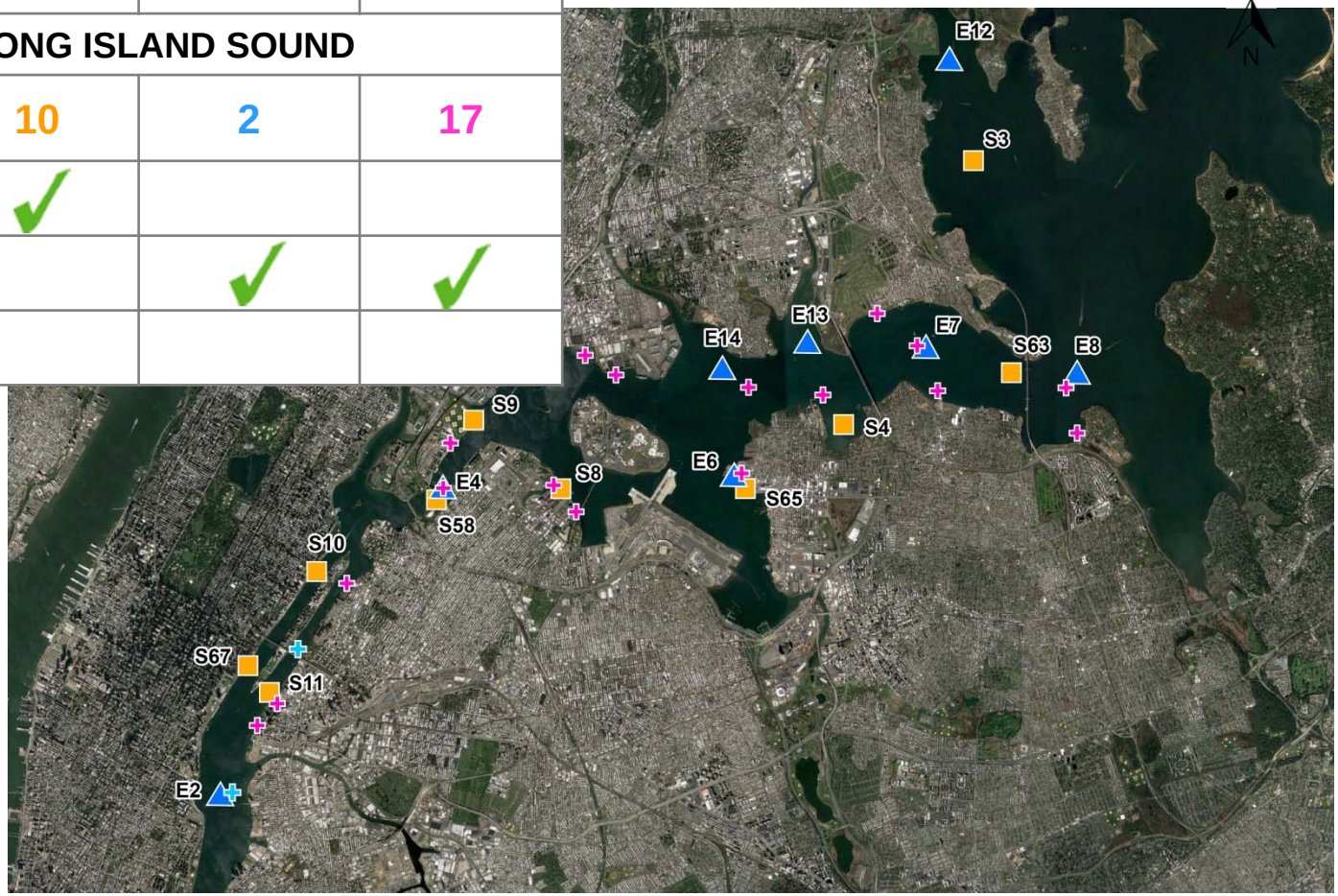
DEP is in the process of assessing attainment with the proposed standards and classifications.

Ongoing Receiving Water Sampling Programs

Program		Harbor Survey Monitoring ◆	Sentinel Monitoring ■	Riverkeeper Sampling +	Citizen Sampling +
Sampling Frequency		Monthly (Oct – May) Weekly (Jun – Sept)	Quarterly	Monthly (May – Oct)	Weekly (May – Oct)
EAST RIVER & LONG ISLAND SOUND					
# of Sampling Locations		8	10	2	17
Parameters	Fecal	✓	✓		
	Entero	✓		✓	✓
	*YSI	✓			

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

Data is available here:
http://www.nyc.gov/html/dep/html/harborwater/harbor_water_sampling_results.shtml
https://www.riverkeeper.org/water-quality/hudson-river/nyc-hudson-bergen/



LTCP Sampling & Monitoring Programs

Sampling Period: 4/1/2017 – 7/23/2017

Flow Monitoring

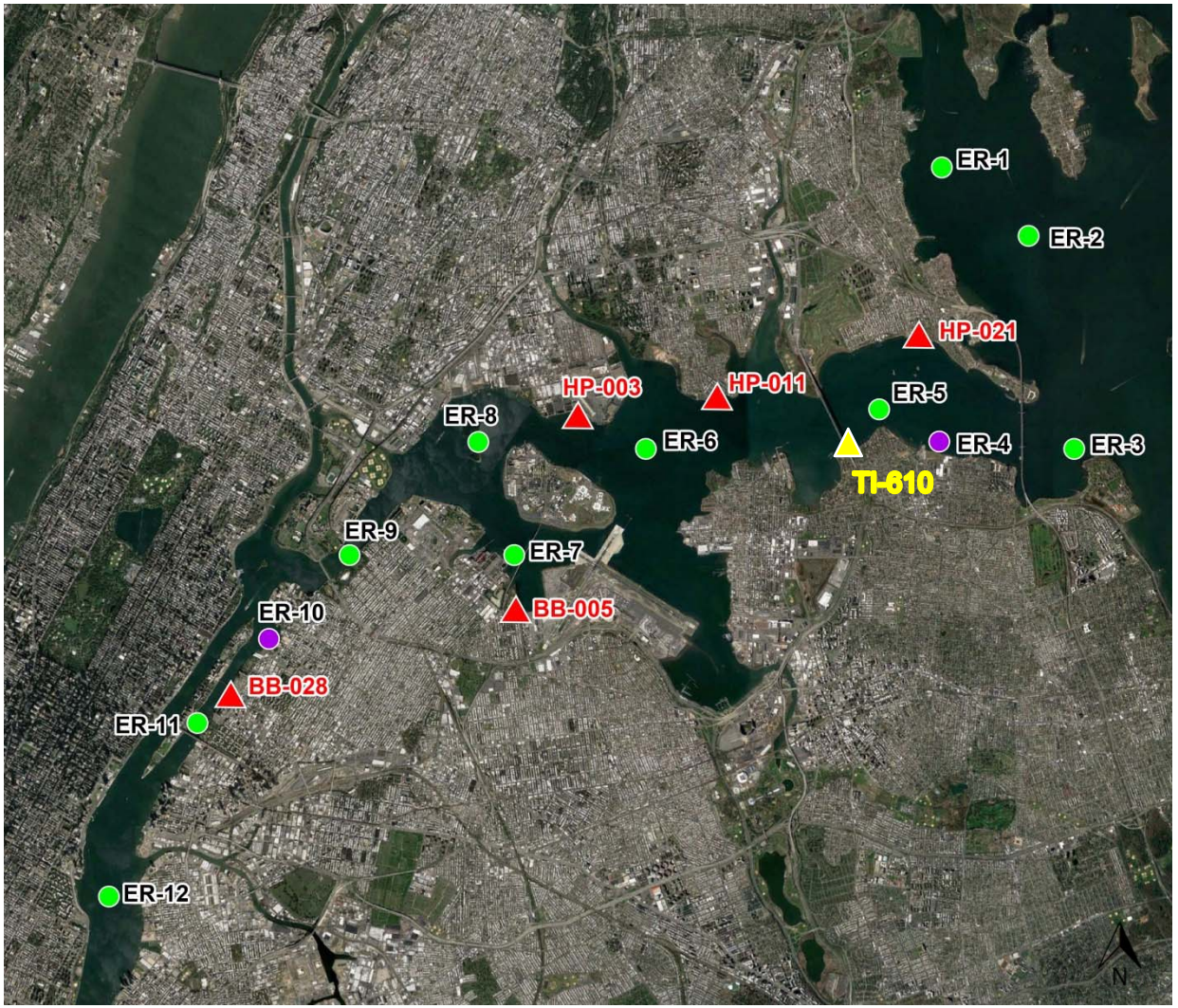
- 3/1/2017 – 7/31/2017
- 5 locations in East River & LIS
- Continuously monitored
- Depth & Velocity measurements

Receiving Water

- 12 locations in East River & LIS
- Two events
- Fecal, Entero, YSI

CSO / MS4 Sampling

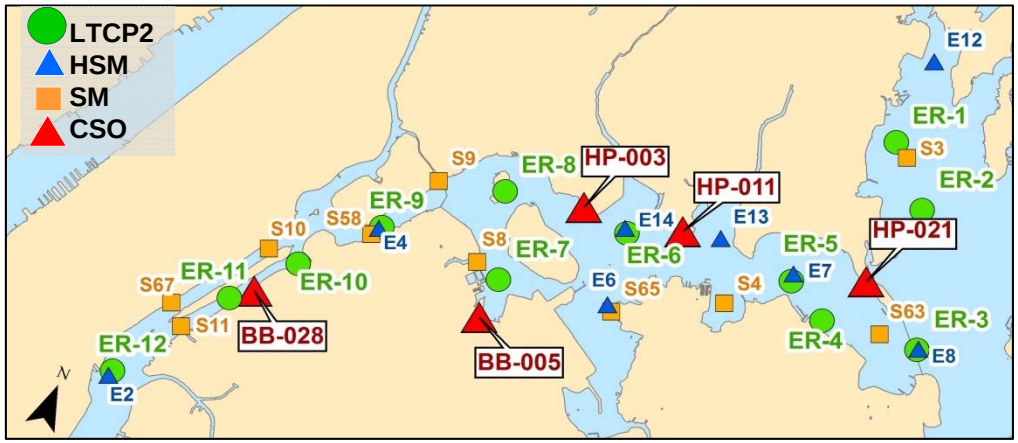
- 5 CSO, 1 MS4 locations in East River & LIS
- 4 wet weather events
- Fecal, Entero, YSI, TSS, CBOD, Nitrogen

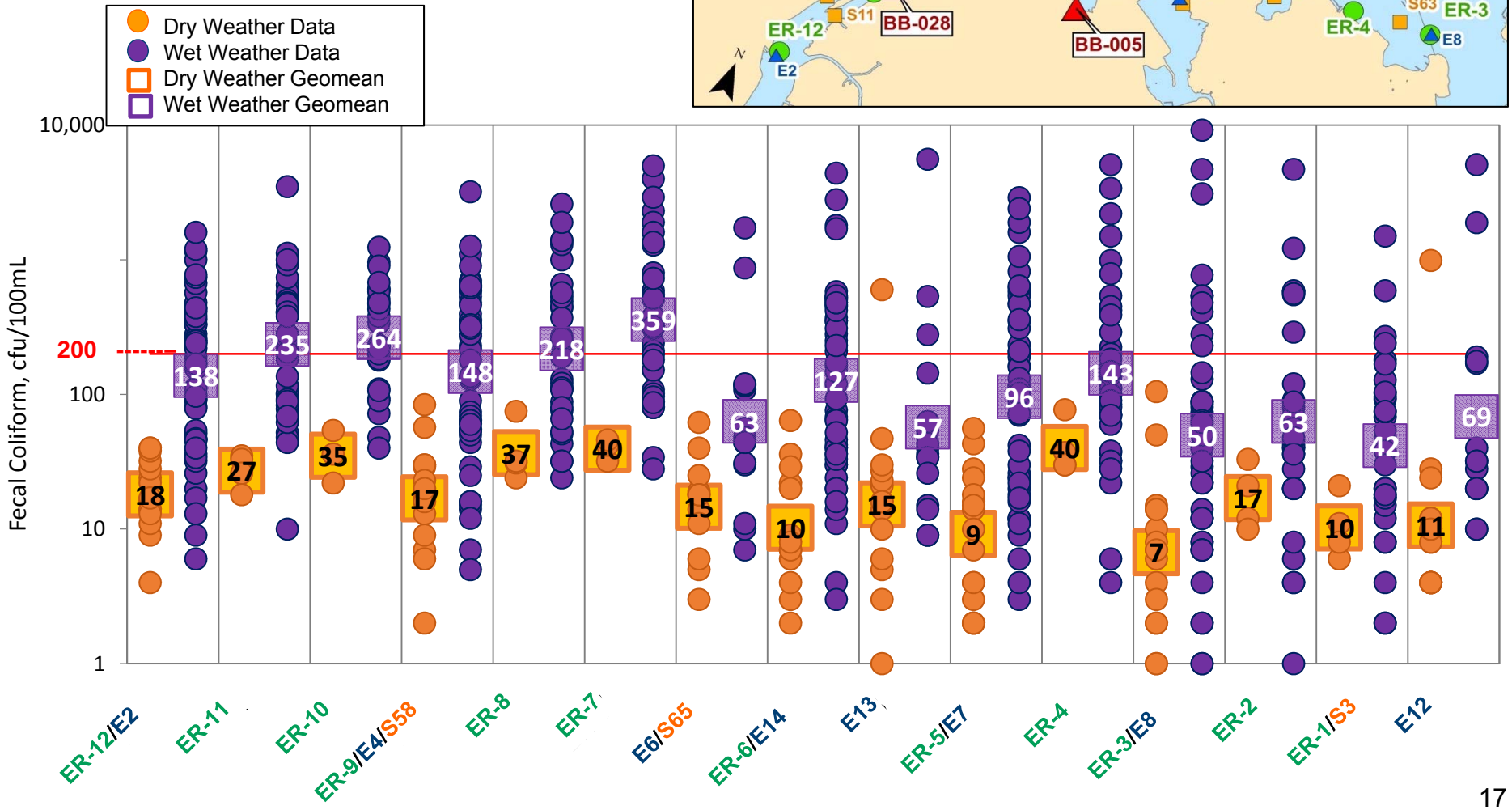


East River & LIS – Fecal Coliform

Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Apr 1 – Jun 23	12	4	38
HSM	Jan 1 – Dec 31	8	10	14
SM	Jan 1 – Oct 31	3	3	1

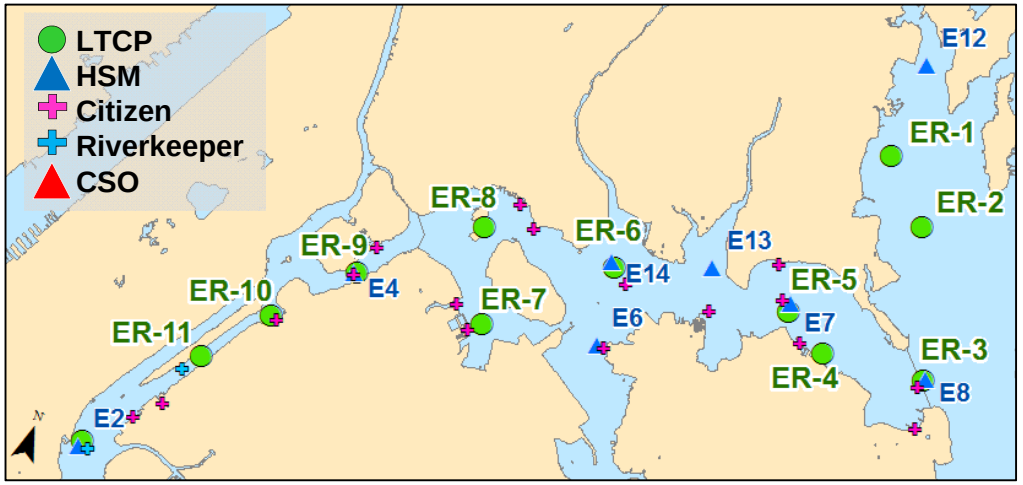


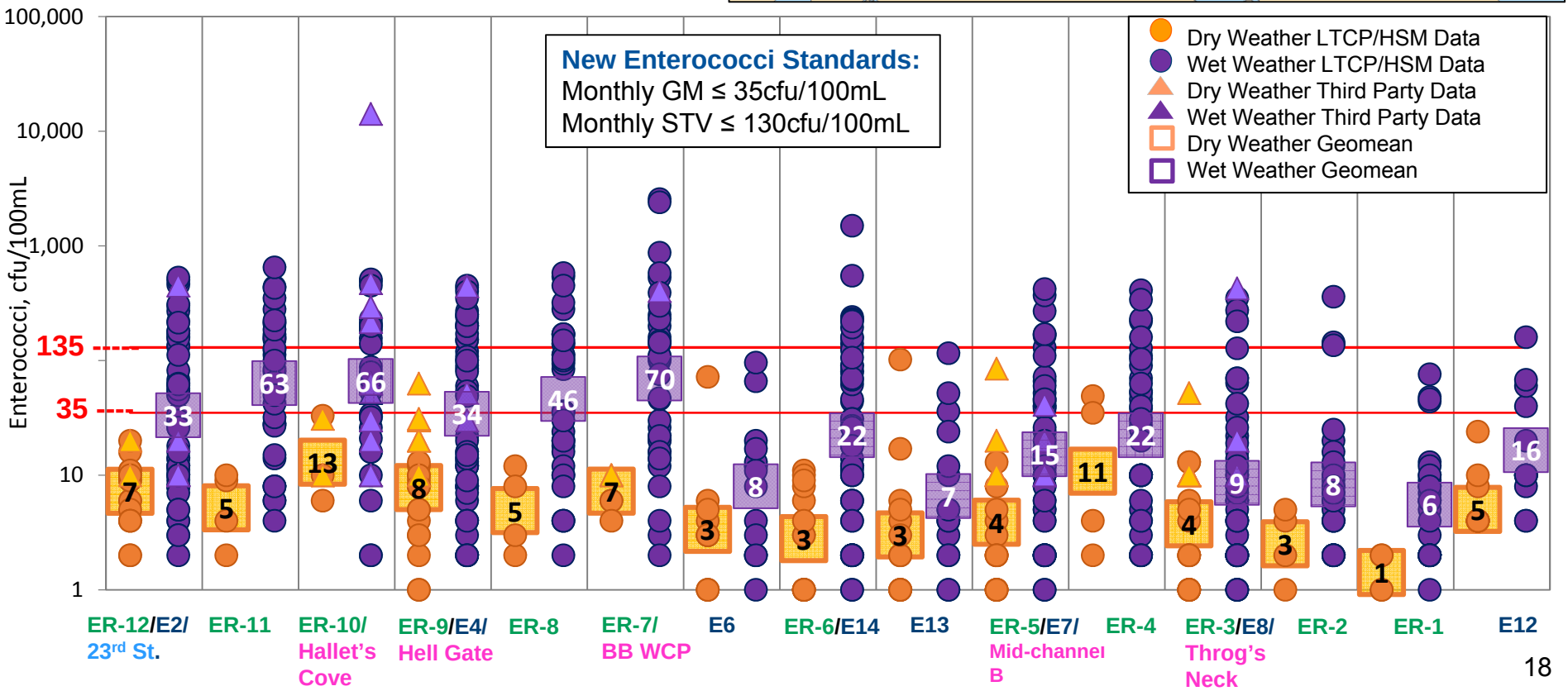


East River & LIS – Enterococcus

Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Apr 1 – Jun 23	12	4	38
HSM	Jan 1 – Dec 31	8	15	16
Riverkeeper	May 1 – Oct 31	1	2	5
Citizen	May 1 – Oct 31	5	7	12



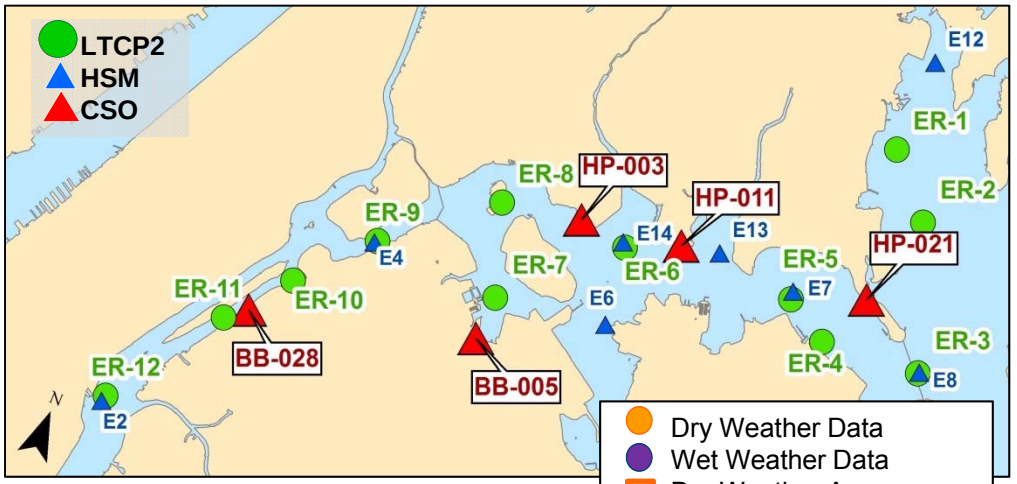


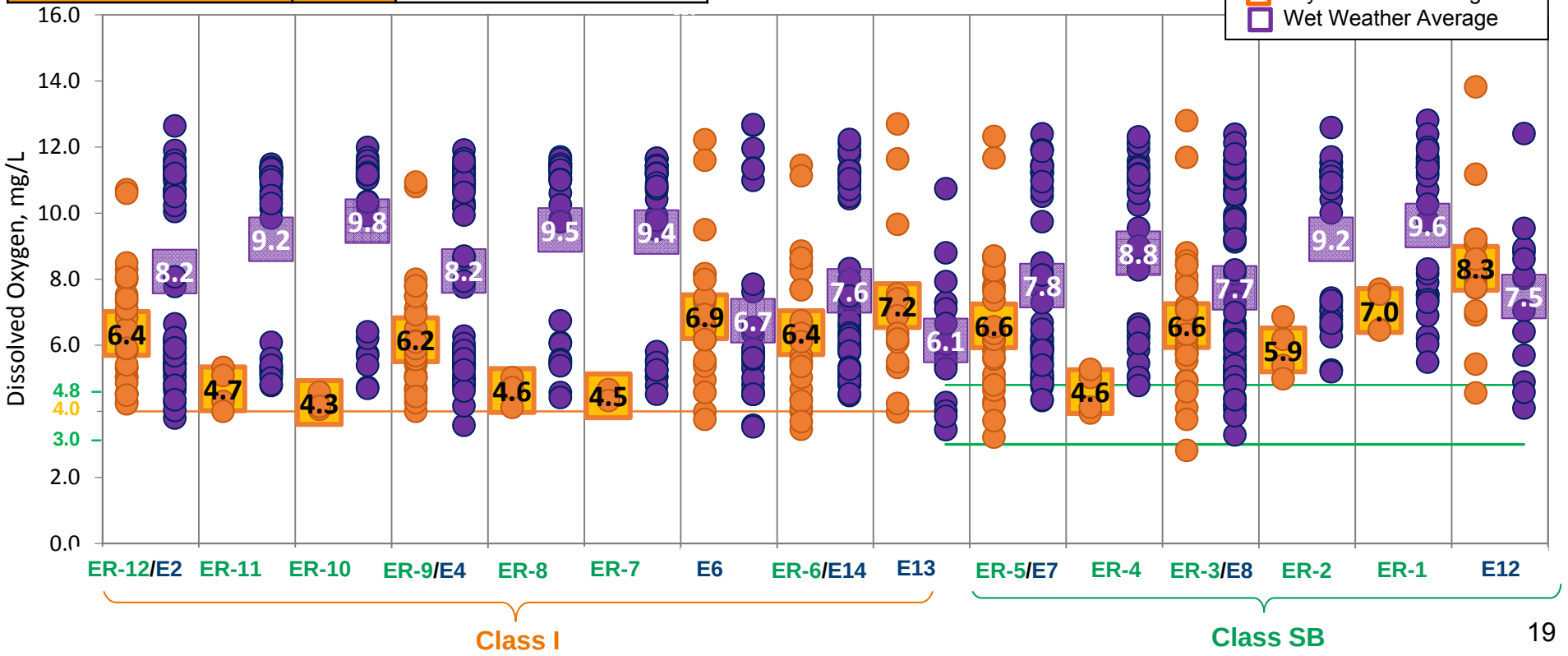
East River & LIS – Dissolved Oxygen

Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Apr 1 – Jun 23	12	4	38
HSM	Jan 1 – Dec 31	8	20	30

Location	Class	Dissolved Oxygen (mg/L)
East River and Long Island Sound (Stations ER-1 – ER-5)	SB	≥ 4.8 (daily average) ≥ 3.0 (acute, never less than)
East River (Stations ER-6 – ER-12)	I	≥ 4.0 (acute, never less than)

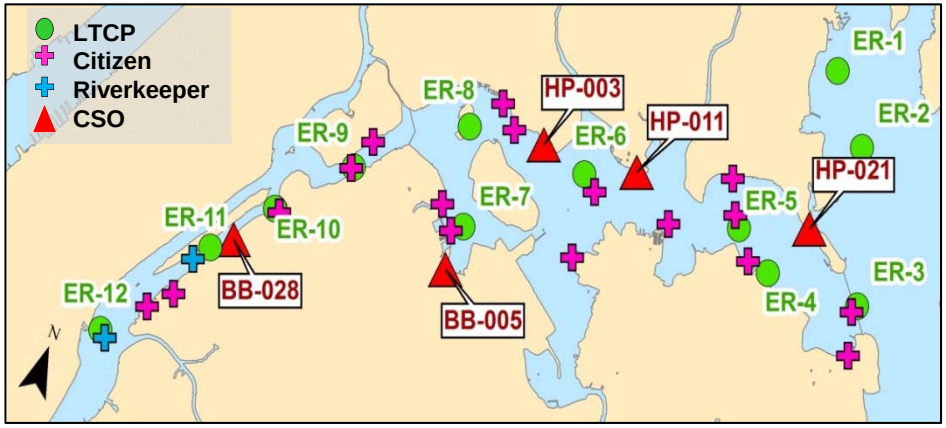


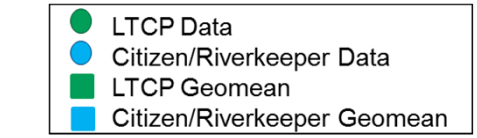


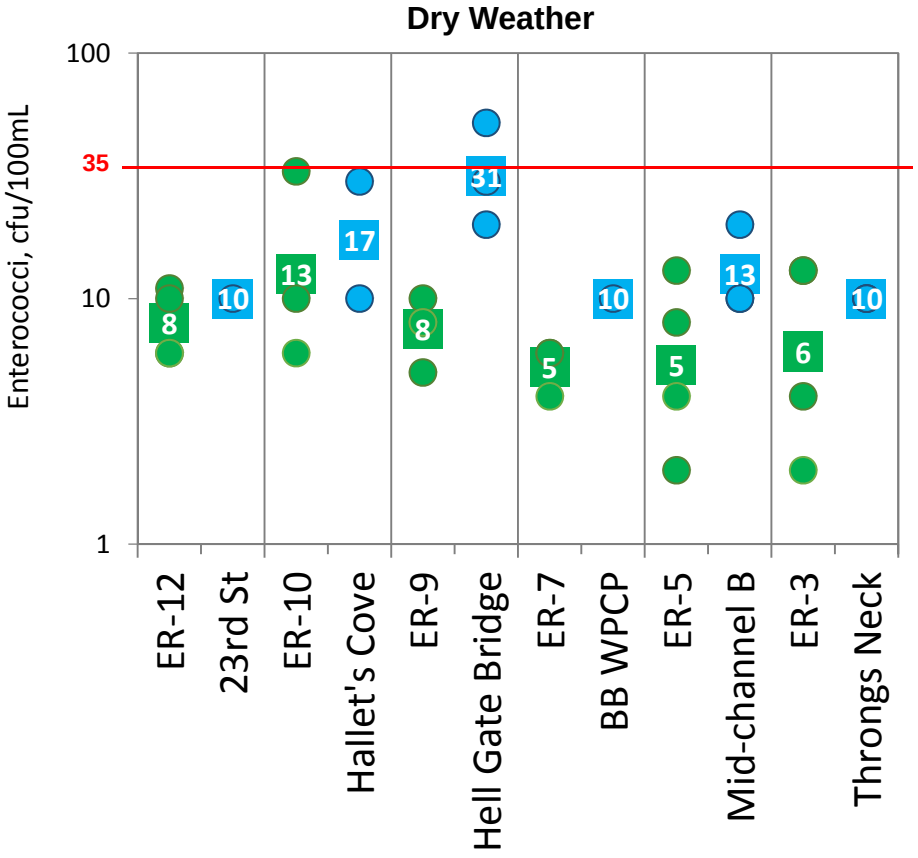
LTCP2/Riverkeeper/Citizen Comparison – Enterococcus

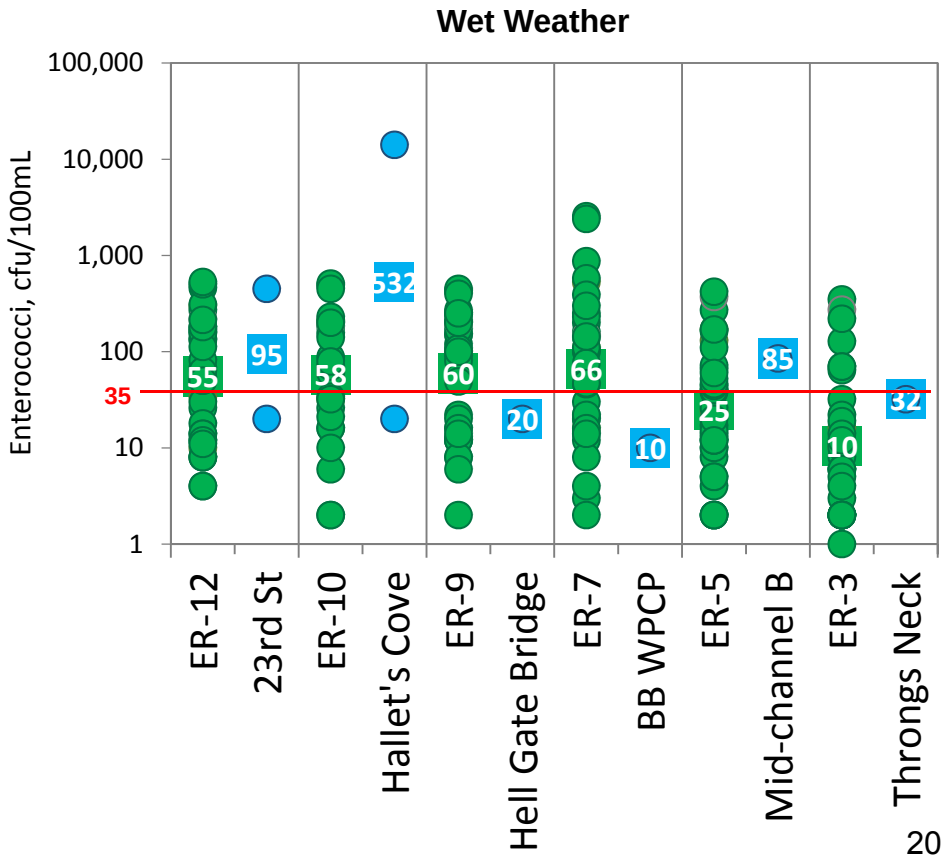
LTCP2 Sampling Period:
April 1 – June 31, 2017

LTCP2: ~4 Dry and 38 Wet Weather Samples per location
Riverkeeper: ~1 Dry and 2 Wet Weather Samples per location
Citizen : ~3 Dry and 1 Wet Weather Samples per location









East River & LIS Projected % Attainment

Station	Baseline Fecal Coliform		Baseline Enterococcus	
	Annual Monthly GM ≤ 200cfu/100mL	Recreational Season Monthly GM ≤ 200cfu/100mL	Recreational Season Monthly GM ≤ 30cfu/100mL	Recreational Season Monthly STV ≤ 110cfu/100mL
ER-1	✓	✓	✓	✓
ER-2	✓	✓	✓	✓
ER-3	✓	✓	✓	✓
ER-4	✓	✓	✓	✓
ER-5	✓	✓	✓	✓
ER-6	✓	✓	✓	86%
ER-7	✓	✓	✓	81%
ER-8	✓	✓	✓	80%
ER-9	✓	✓	✓	80%
ER-10	✓	✓	✓	80%
ER-11	✓	✓	✓	80%
ER-12	✓	✓	✓	80%

✓ ≥ 95% Attainment

Notes: **Preliminary Existing Conditions Gap Analysis; Attainment based on modeled 10-year averages. On March 21, 2019, DEC publicly noticed a revision to the WQS and Classifications for certain waterbodies. DEP is in the process of modeling attainment with the proposed standard and classifications.**

- Upper East River and Lower Long Island Sound have a total of 95 CSO outfalls; 42% of the annual CSO volume occurs in 3 outfalls
- Sampling has shown a wet weather impact on bacteria concentrations
- Models predict attainment of existing WQS criteria

Water Quality Improvement Projects

Grey Infrastructure

Keith Mahoney, PE
Director of Water Quality Planning
DEP

Existing Grey Infrastructure Projects

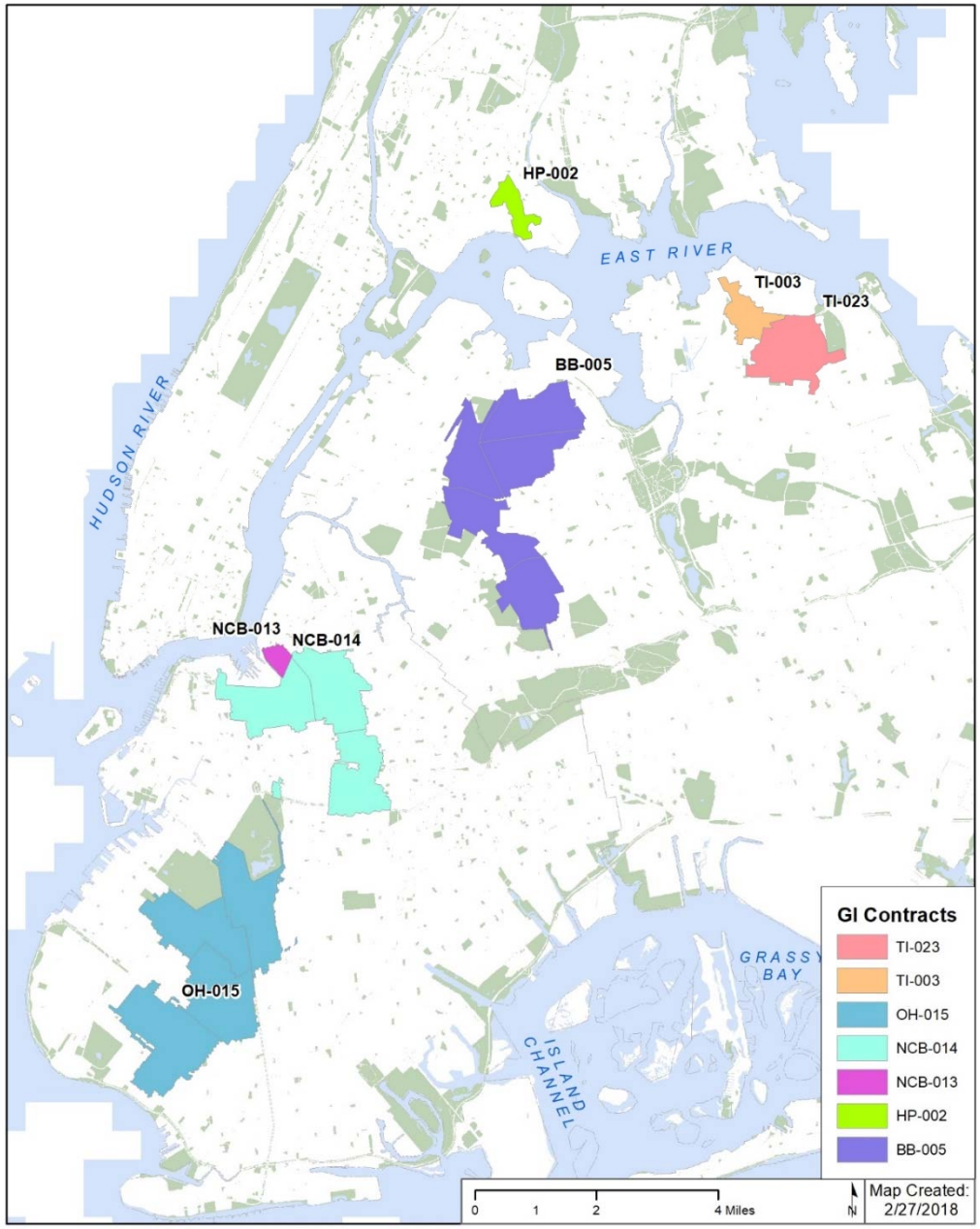
- Wards Island WWTP Headworks
- Bowery Bay WWTP Headworks
- Hunts Point WWTP Headworks
- Tallman Island WWTP Conveyance

Water Quality Improvement Projects

Green Infrastructure

Melissa Enoch
Program Manager, Private Incentives
DEP

East River/Open Waters Contract Areas



GI is being implemented in combined sewer areas tributary to:

- Gravesend Bay (OH-015)
- Wallabout Creek (NCB-014/-013)
- BB-005 – Bowery Bay
- HP-002 – Barretto Cove
- TI-023 – Little Bay
- TI-003 – Powells Cove

Green Infrastructure Assets:

- Constructed – 103
- In Construction – 14
- In Design – 929

Public Property Retrofits in East River/Open Waters

NYC Environmental Protection

P.S. 15 Roberto Clemente
333 East 4th Street, Manhattan

Project Status	Parks/ Playgrounds	Public Schoolyards	Total
Preliminary	1	7	8
In Design	7	4	11
In Construction	14	0	14
Constructed	9	3	12
Total	31	14	45

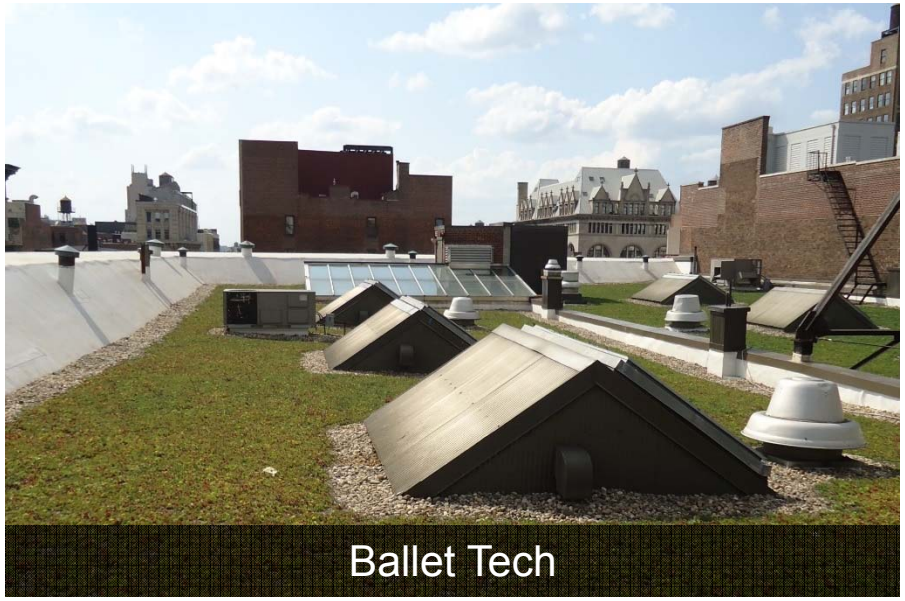
Private Property GI Programs

Green Infrastructure Grant Program

- More than $14.5 million committed to date to 35 private property owners
- 26 grants awarded in EROW

NYC Housing and Preservation Department Partnership

- Establishing on-going funding source for GI as part of HPD new affordable housing development
- 1 project in FY18, up to 5 projects in FY19 as initial investment



Ballet Tech

The New School

Private Property GI Programs

New Private Property Retrofit Program

- Phase One Goal: retrofit 200 Greened Acres* in Tier 1 and Tier 2 sites

Privately Owned Sites in Combined Sewer Area	
Tier 1 – Over 100,000 sf	693
Tier 2 – 50,000-99,999 sf	896

- RFP to select Program Administrator **anticipated release date:** Q2 2018

- DEP will jumpstart outreach to Tier 1 and Tier 2 property owners and community organizations in 2018

**a Greened Acre is defined as 1" of rainfall on one acre of impervious surfaces or 1.5" on 0.67 acre of impervious surfaces, etc.*

Other Private Property GI Opportunities

- **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.

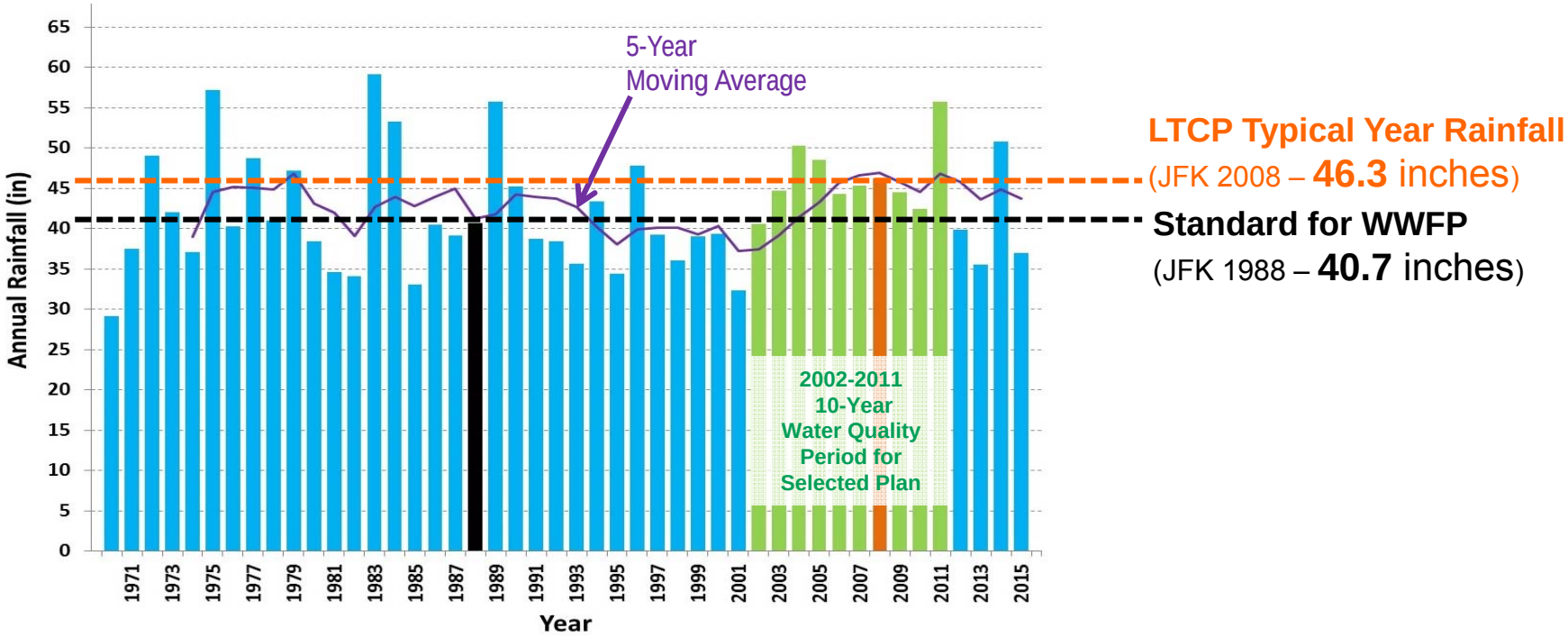
- **2012 Stormwater Rule:**
  In 2012, DEP amended the allowable flow rate of stormwater to the City's combined sewer system for new and existing development. Site Connection Proposals may include green infrastructure technologies to meet the new allowable rate.

LTCP Modeling and Alternatives Development Process

Keith Mahoney, PE
Director of Water Quality Planning
DEP

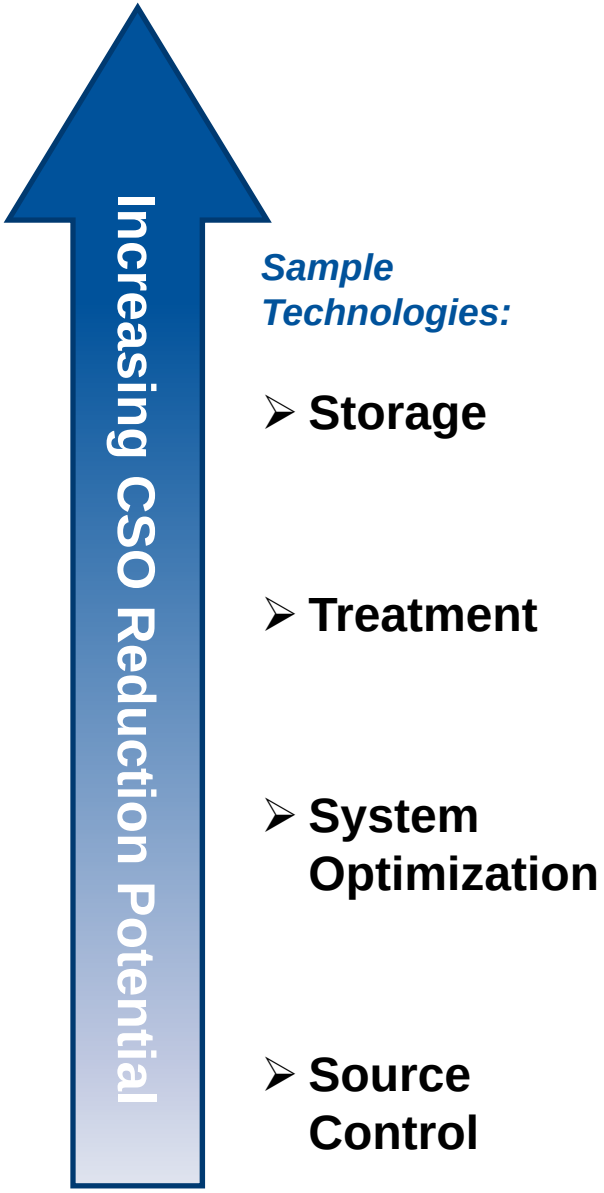
Model Inputs and Assumptions

- **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



CSO Control Evaluation Process

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



CSO Mitigation Toolbox

Source Control	Green Infrastructure		Storm Sewers		
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	Wetland Restoration & Daylighting		
Treatment ***Satellite:***	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)	
Centralized:	WWTP Expansion				
Storage	In-System	Shaft	Tank	Tunnel	

Next Steps

Mikelle Adgate
Senior Policy Advisor
DEP

Next Steps

- **Alternatives and LTCP Recommendation Meetings**, **TBD**

- Public opportunity to review and comment on DEP's selected alternative before the LTCP is submitted to DEC

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

Additional Information & Resources

- 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