



Citywide/Open Waters CSO Long Term Control Plan

Public Kickoff Meeting

Lower East River, Kill van Kull,
Arthur Kill, and New York Bay

St. John's University, Staten Island

March 27, 2018

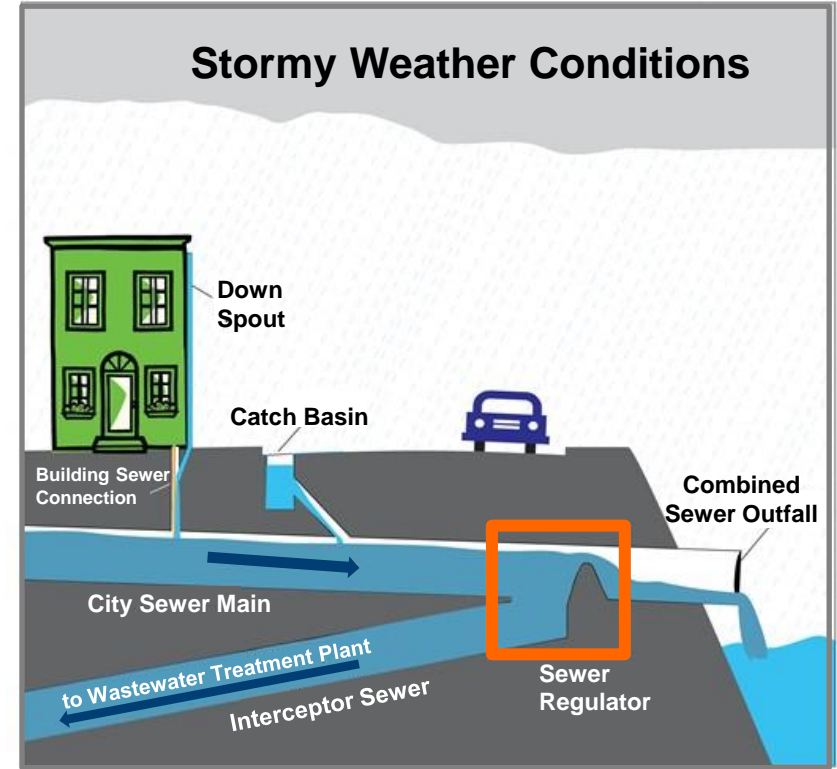
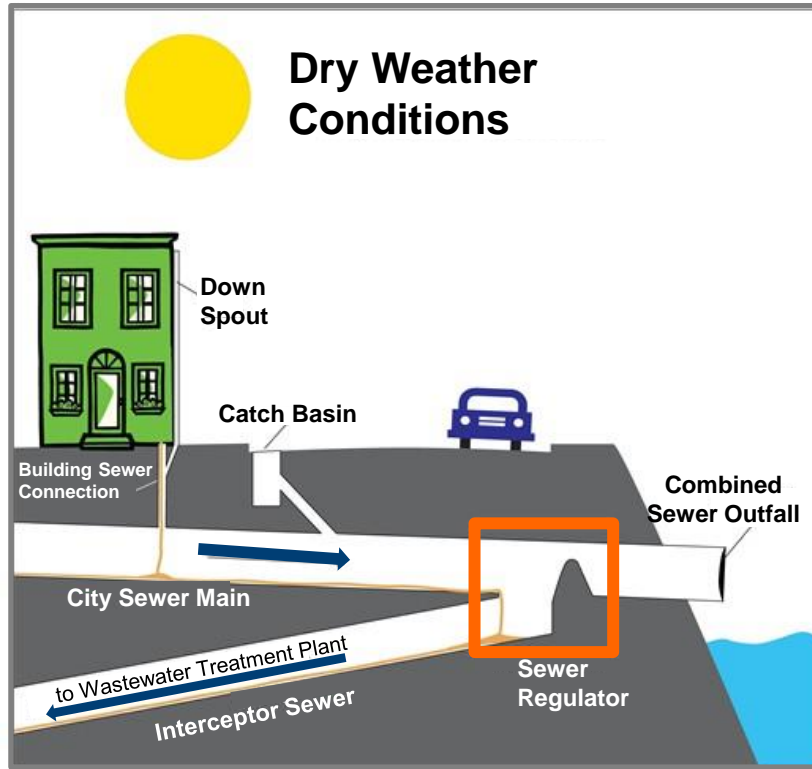
	Topic	Speaker
1	Welcome & Introduction	Mikelle Adgate
2	Waterbody & Watershed Characteristics and Water Quality Sampling	Keith Mahoney
3	Water Quality Improvement Projects <ul style="list-style-type: none">• Grey Infrastructure• Green Infrastructure	Keith Mahoney Melissa Enoch
4	LTCP Modeling & Alternative 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).

➤ **Not every rainfall causes a CSO event:**

- **Approximately 40%** of the average rainfall events per year may trigger a CSO into the Lower East River, Kill van Kull, or New York Harbor

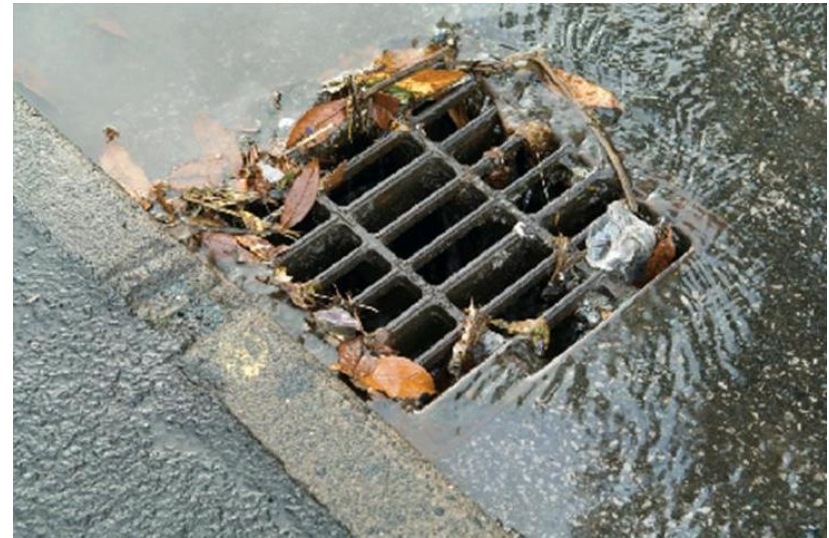


Photo Credit: Baptisete Pons
<https://www.flickr.com/photos/bpt/2882285636/>

Long Term Control Plan (LTCP)

identifies appropriate CSO controls to achieve applicable water quality standards

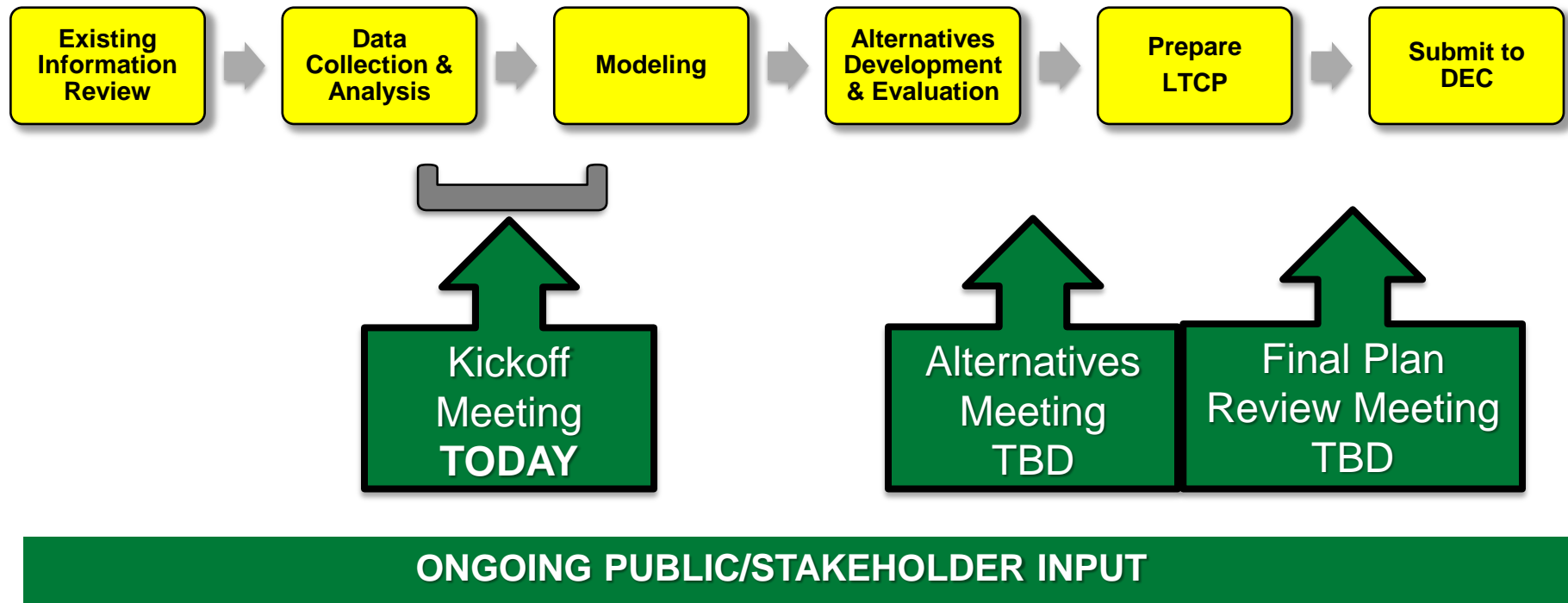
consistent with the Federal CSO Policy and Clean Water Act

CSO Consent Order

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

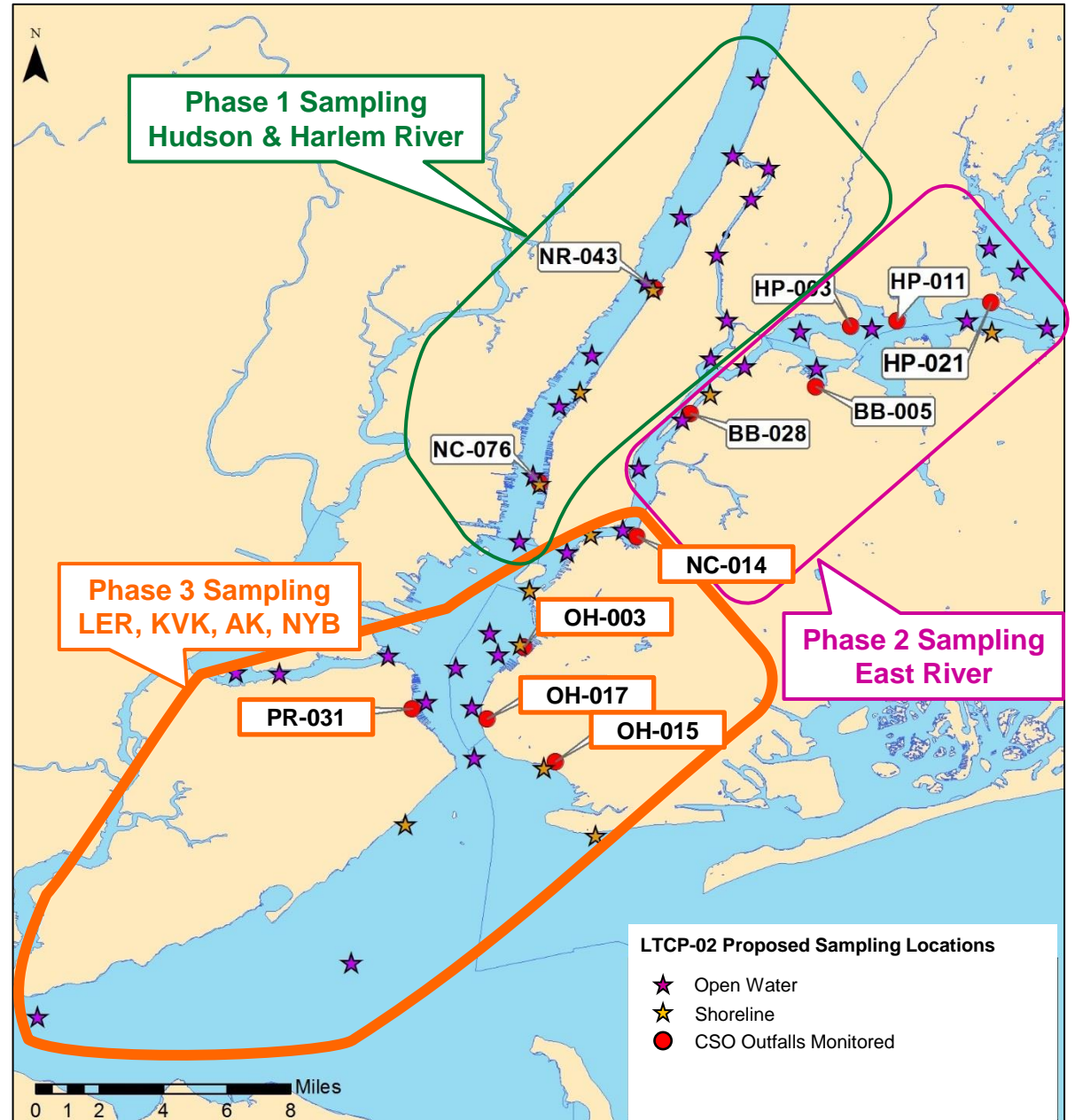
DEC requires DEP to develop LTCPs and mitigate CSOs

LTCP Process and Public Involvement



LER, KVK, AK, NYB in Phase 3 Sampling






- The Citywide/Open Waters Sampling Program was divided into 3 Phases
- Lower East River, Kill van Kull, Arthur Kill, and New York Bay were covered under Phase 3

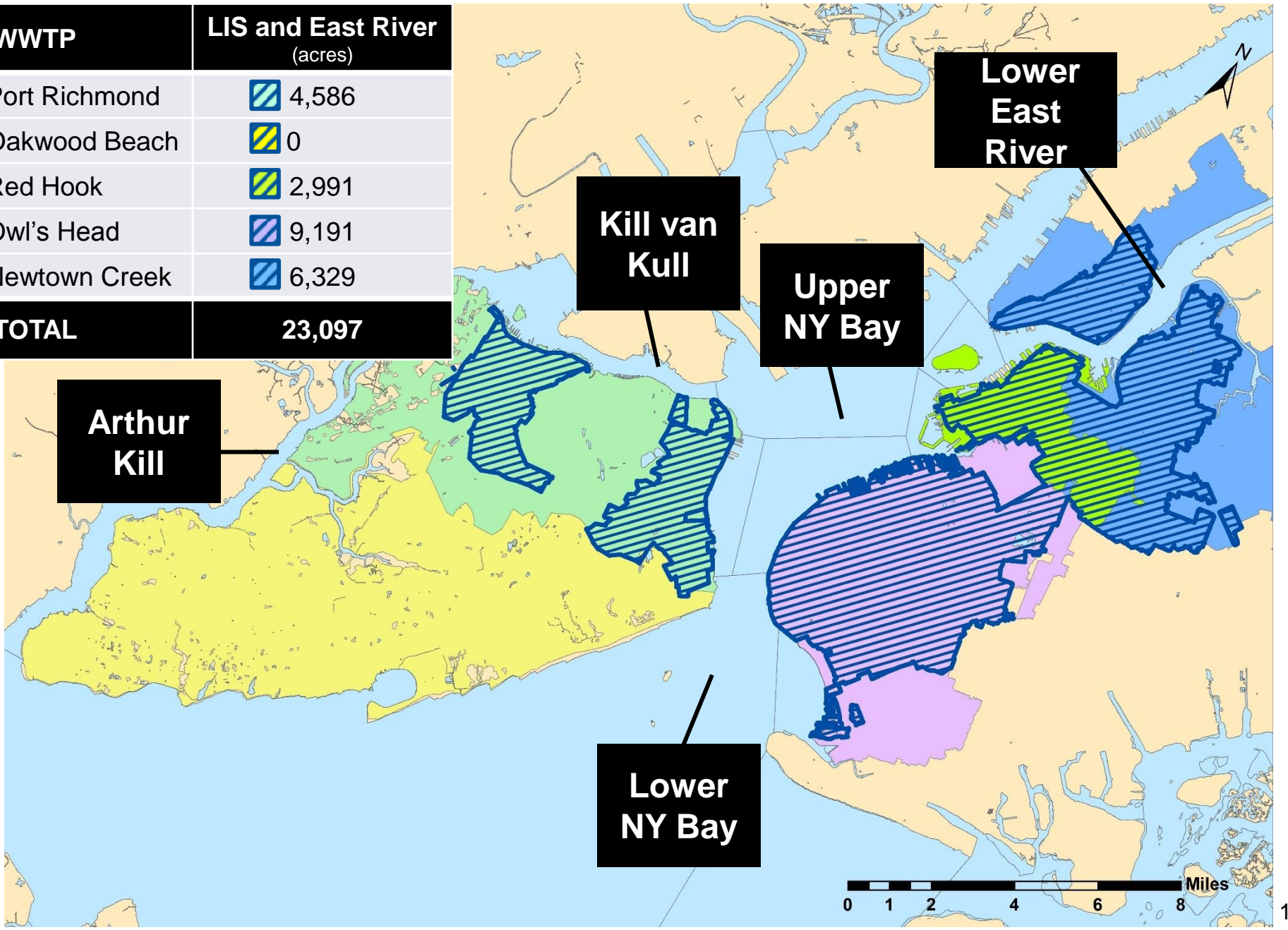


Waterbody & Watershed Characteristics and Water Quality Sampling

Keith Mahoney, PE
Director of Water Quality Planning
DEP

Combined Sewer Drainage Areas to LER, KVK, AK, NYB

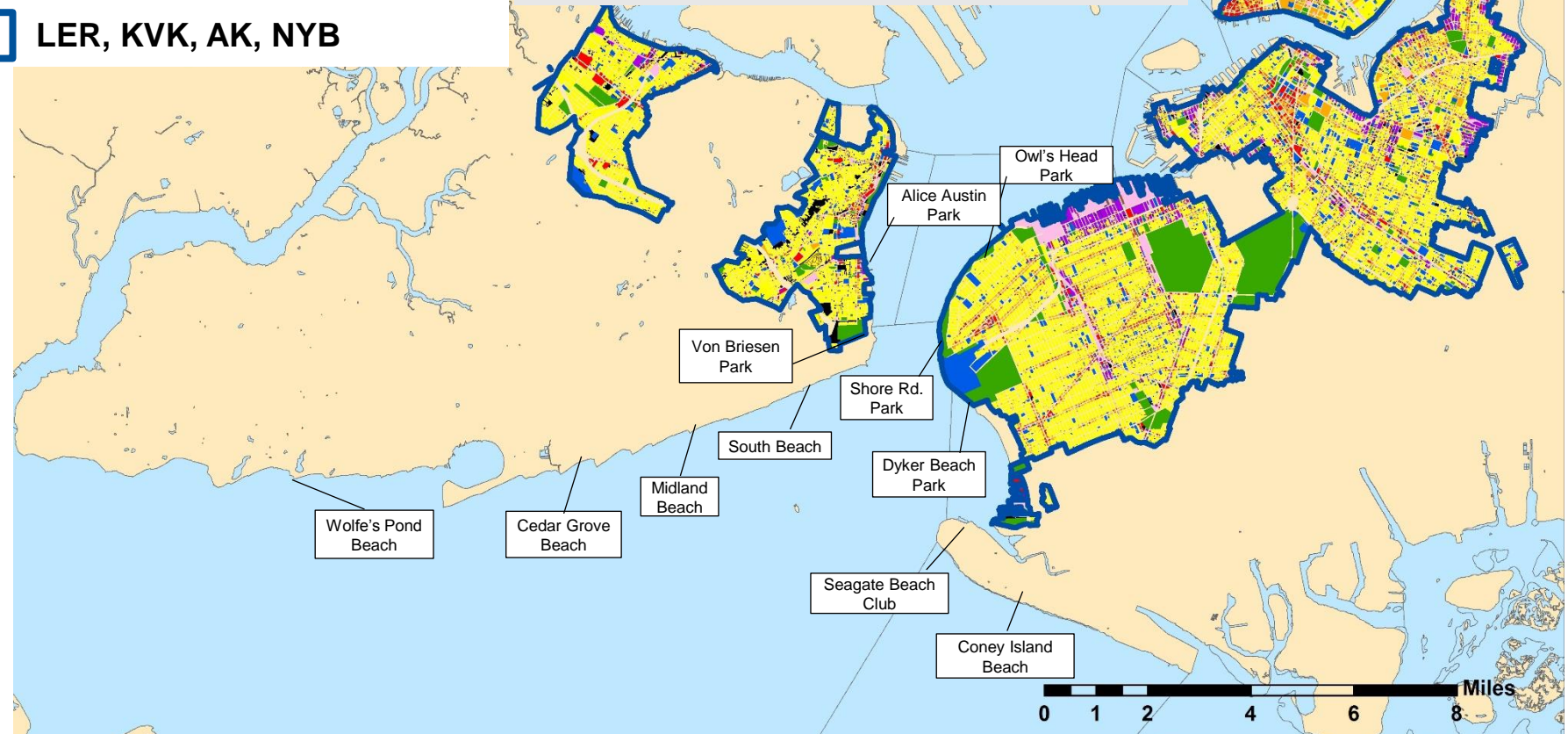
WWTP	LIS and East River (acres)
Port Richmond	 4,586
Oakwood Beach	 0
Red Hook	 2,991
Owl's Head	 9,191
Newtown Creek	 6,329
TOTAL	23,097



Land Use in Combined Sewer Drainage Area

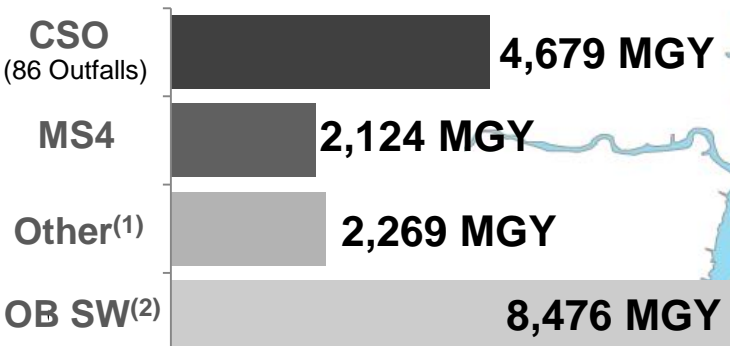
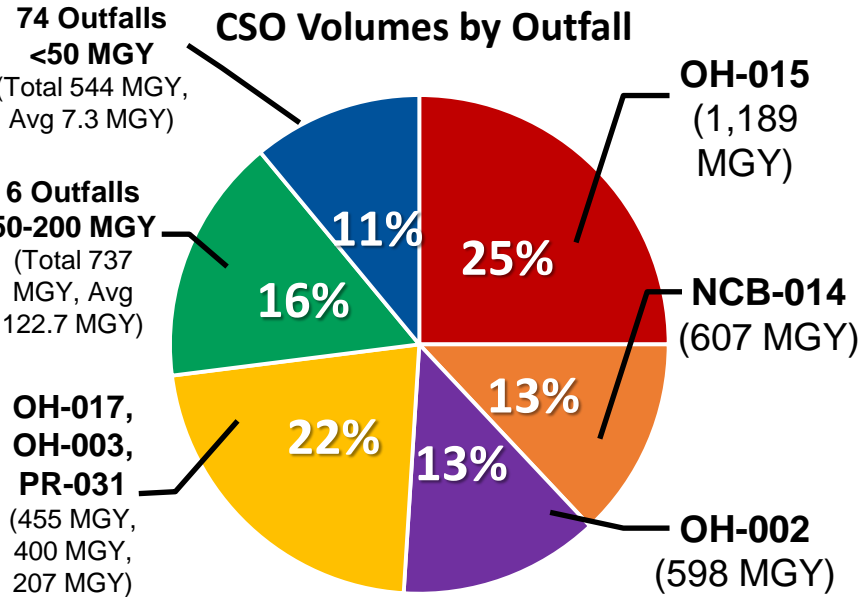
- Residential
- Mixed Residential
- Commercial and Office
- Industrial and Manufacturing
- Transportation and Utility
- Public Facilities and Institutions
- Open Space and Outdoor Recreation
- Parking Facilities
- Vacant Land
- LER, KVK, AK, NYB

Land Use	LER, NYB, KVK, AK
Residential	44%
Mixed Residential & Commercial	13%
Commercial	6%
Transportation & Utility	9%
Public Facilities	12%
Park & Open Space	14%
Other	2%

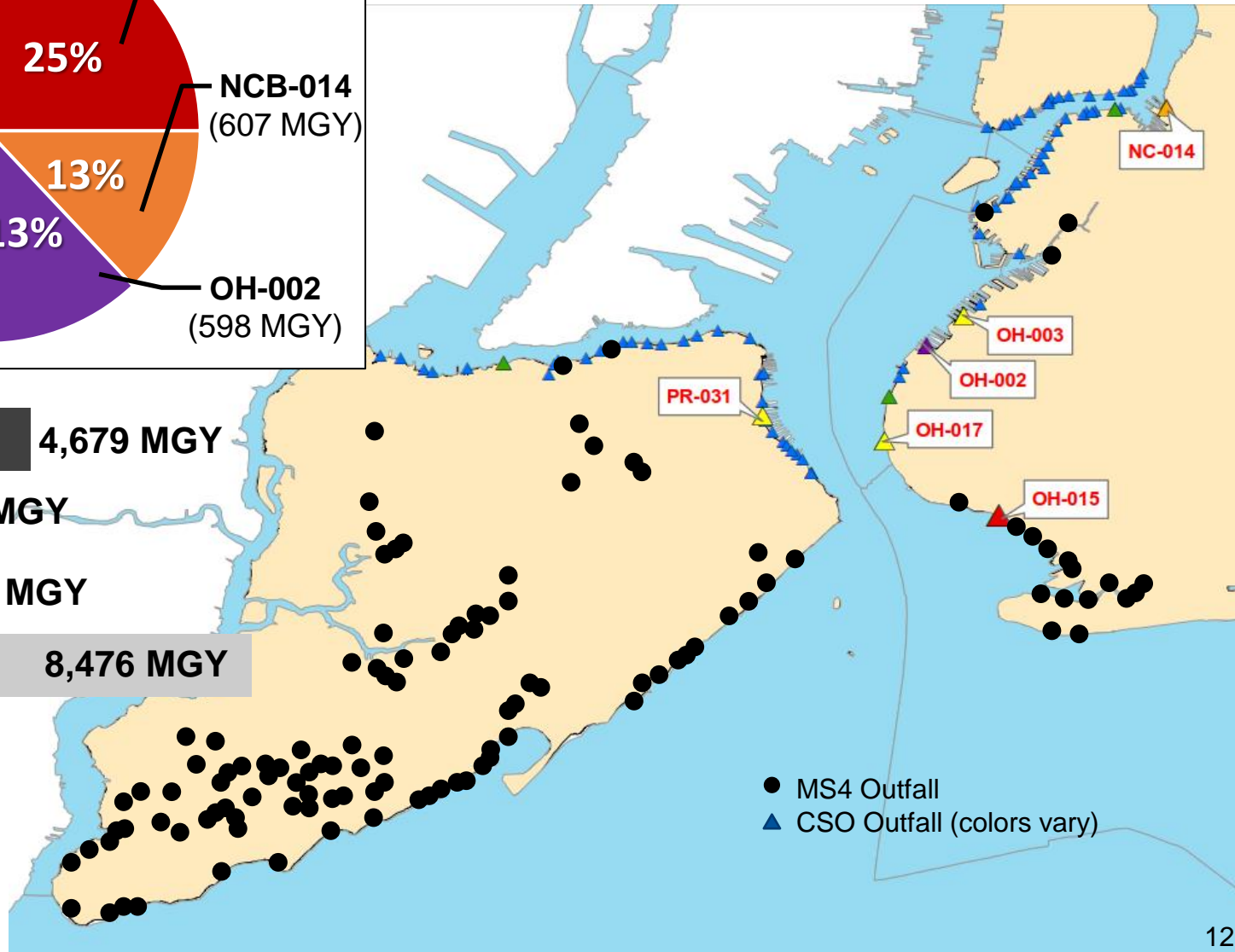


LER, KVK, AK, NYB Overview

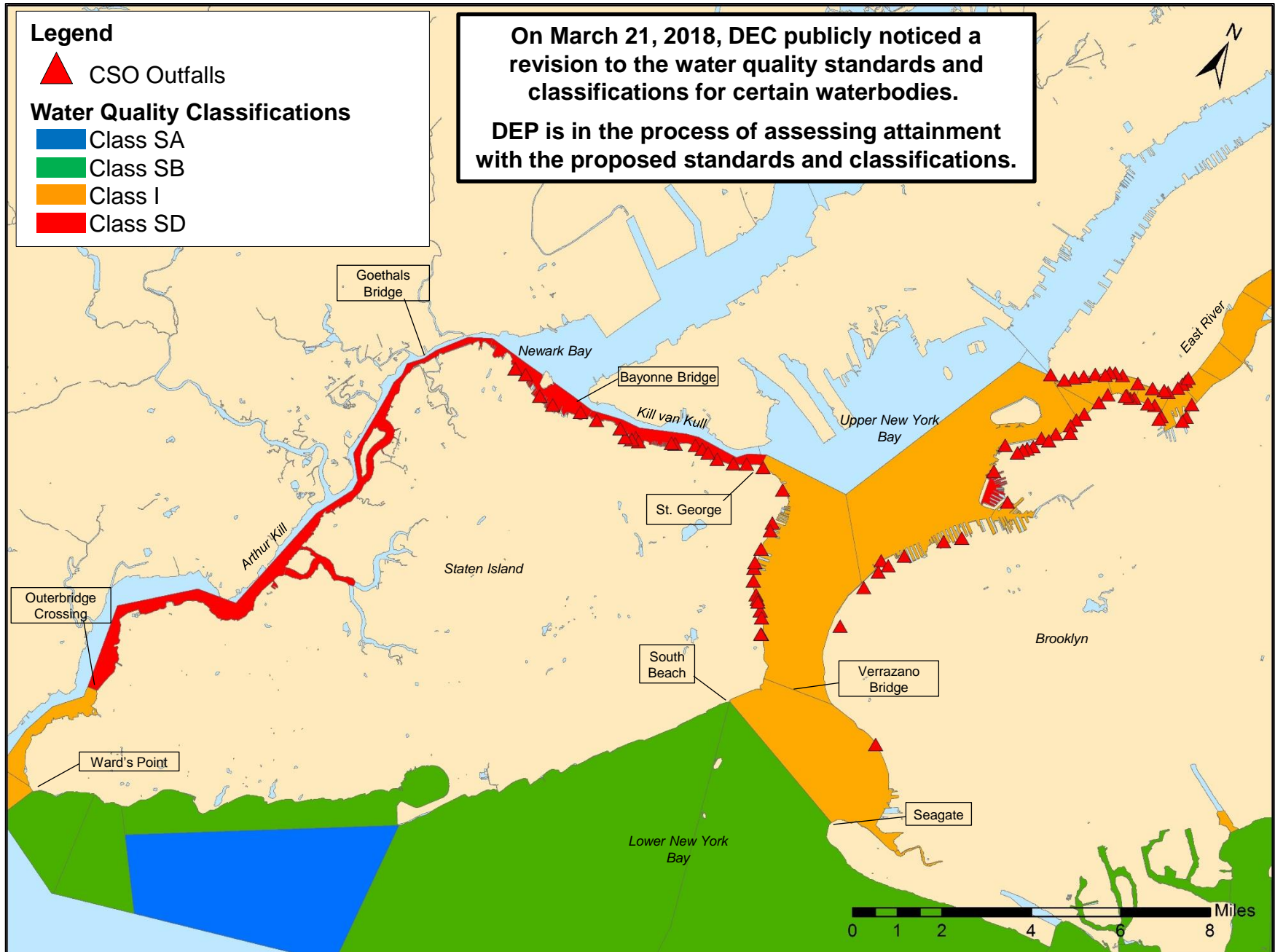
Note: Preliminary Existing Condition Modeling results.



(1) Includes direct drainage and other non-DEP stormwater
 (2) Oakwood Beach SW from October 2007 WWFP Modeling Report



LER, KVK, AK, NYB Overview



Water Quality Standards and LTCP Goals

CLASS SA

Shellfish

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

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.

CLASS SD

Boating/Fishing

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 this purpose.

Location	Class	Dissolved Oxygen* (mg/L)	Fecal Coliform** (col/100 mL)	Total Coliform** (col/100 mL)
Lower NYB	SA	≥ 4.8 (daily average)	Monthly Geometric Mean ≤ 200	Monthly Median ≤ 2,400 and 80% ≤ 5,000
Lower NYB	SB	≥ 3.0 (acute, never less than)		
LES, Upper NYB, Arthur Kill	I	≥ 4.0 (acute, never less than)		
Kill van Kull, Arthur Kill	SD	> 3.0 (acute, never less than)		

➤ 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.

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

LTCP Sampling & Monitoring Programs

Sampling Period: 10/10/2017 – 12/9/2017

Flow Monitoring

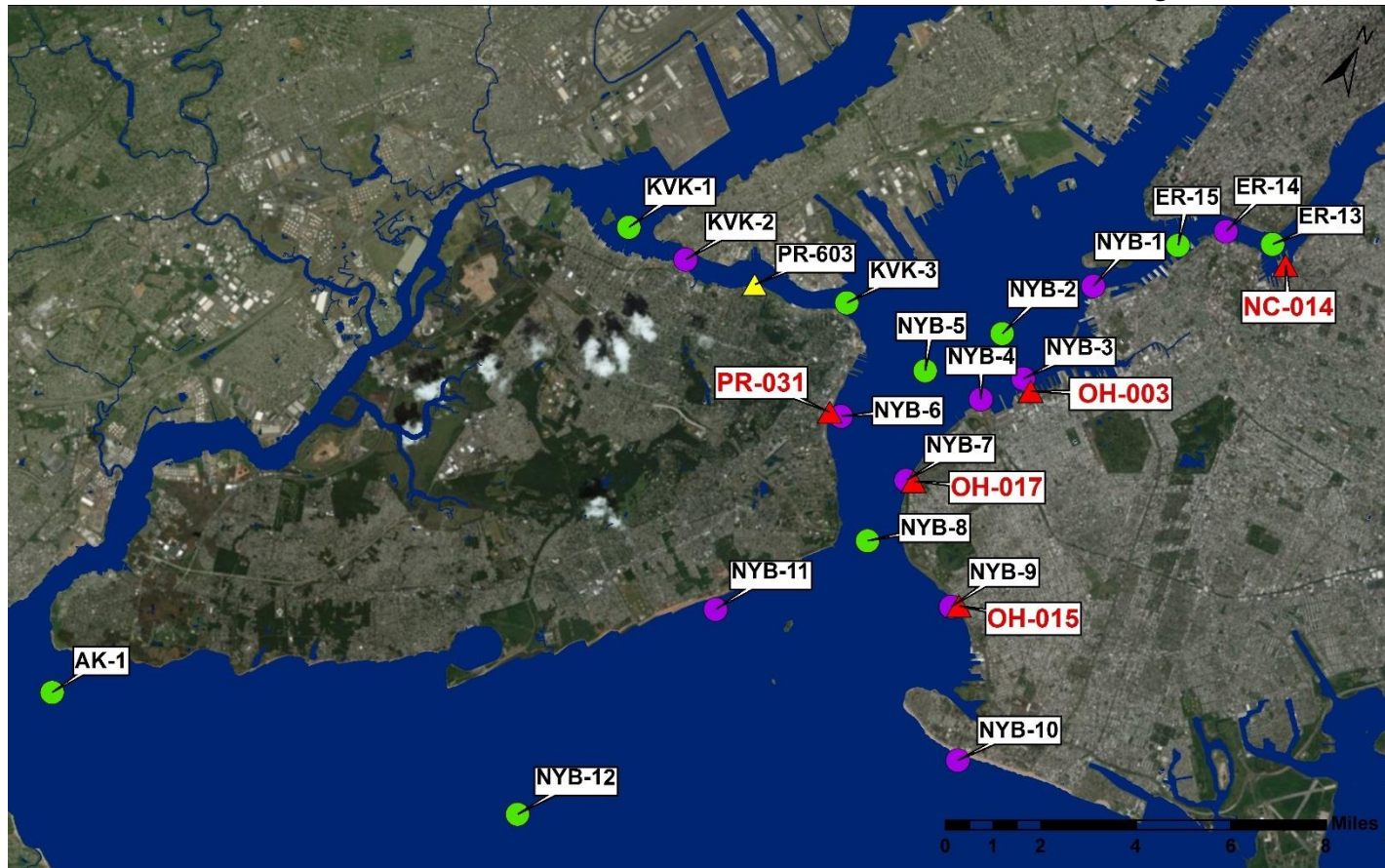
- 7/11/2017 – 12/31/2017
- 5 CSO locations in LER, NYB
- Continuously monitored
- Depth & Velocity measurements

Receiving Water

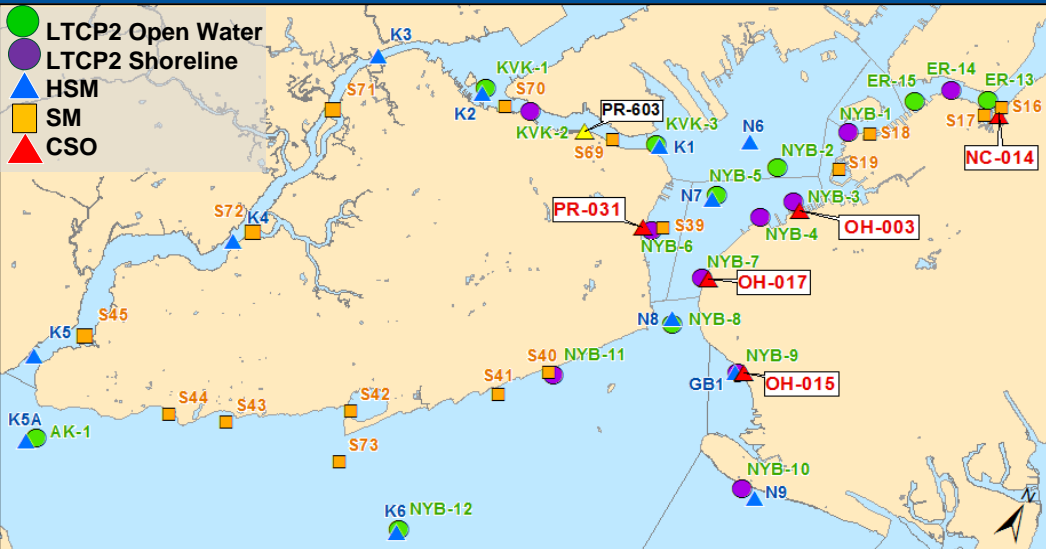
- 19 locations in LER, KVK, AK, NYB (10 shoreline, 9 open water)
- Two events
- Fecal, Entero, YSI

CSO / MS4 Sampling

- 5 CSO, 1 MS4 locations in LER, KVK, NYB
- 6 wet weather events
- Fecal, Entero, YSI, TSS, CBOD, Nitrogen

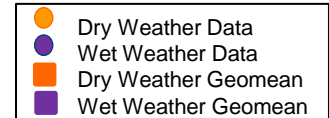


AK and KVK – Fecal Coliform



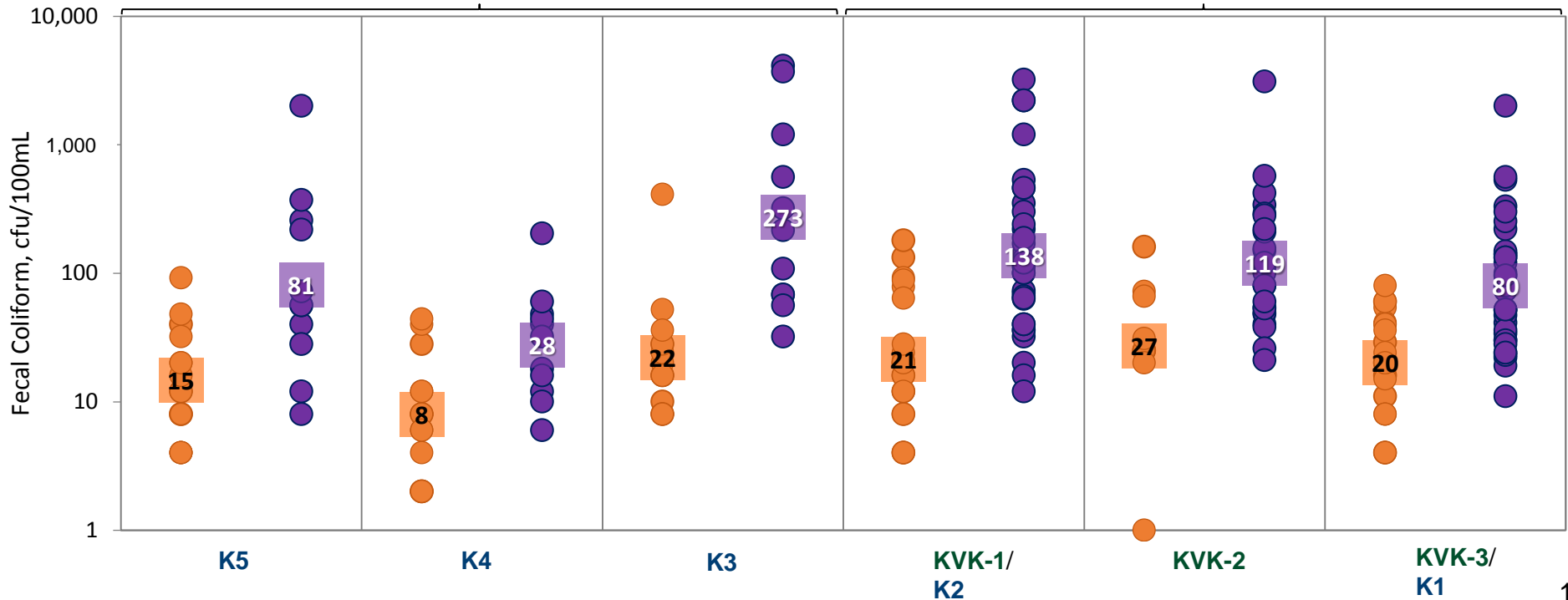
Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Oct 10 – Dec 9	3	8	26
HSM	Jan 1 – Dec 31	5	14	11
SM	Jan 1 – Dec 31	5	2	2

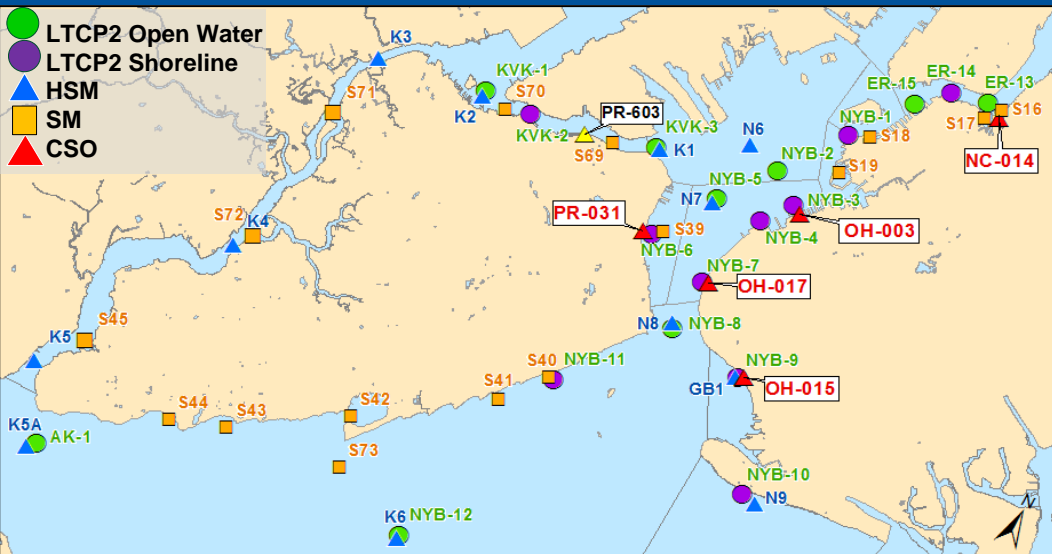


Arthur Kill

Kill van Kull

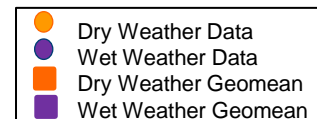


LER and NYB – Fecal Coliform



Sampling Details

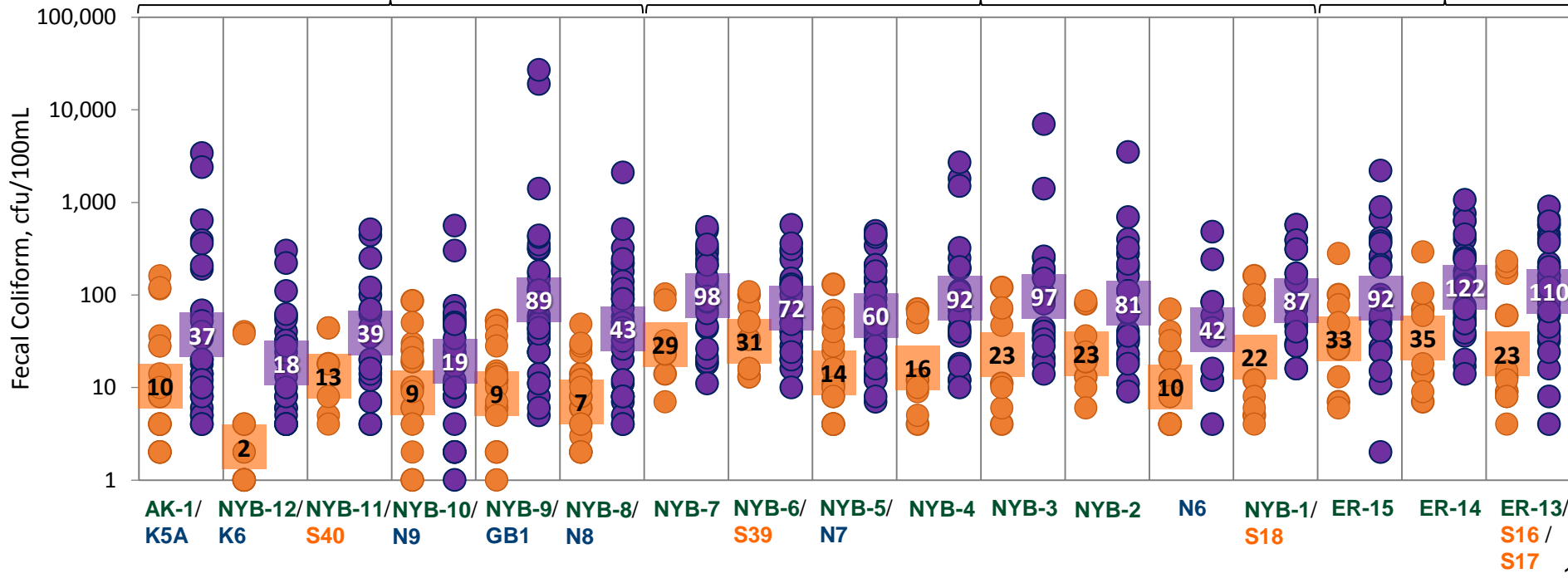
	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Oct 10 – Dec 9	16	8	26
HSM	Jan 1 – Dec 31	7	14	11
SM	Jan 1 – Dec 31	11	2	2



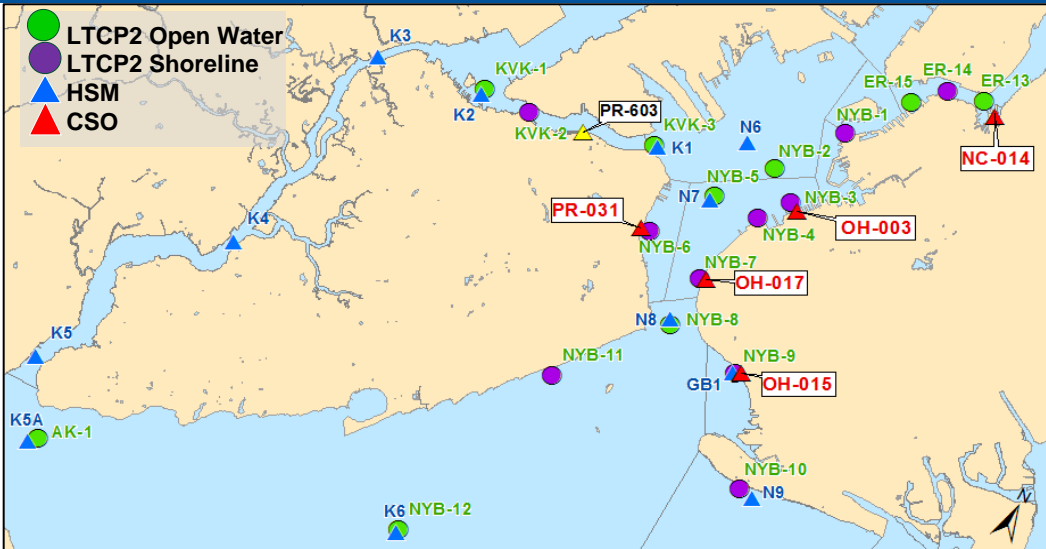
Lower NYB

Upper NYB

Lower East River

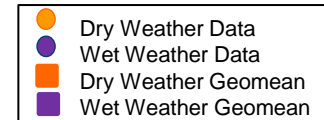


AK and KVK – Enterococci



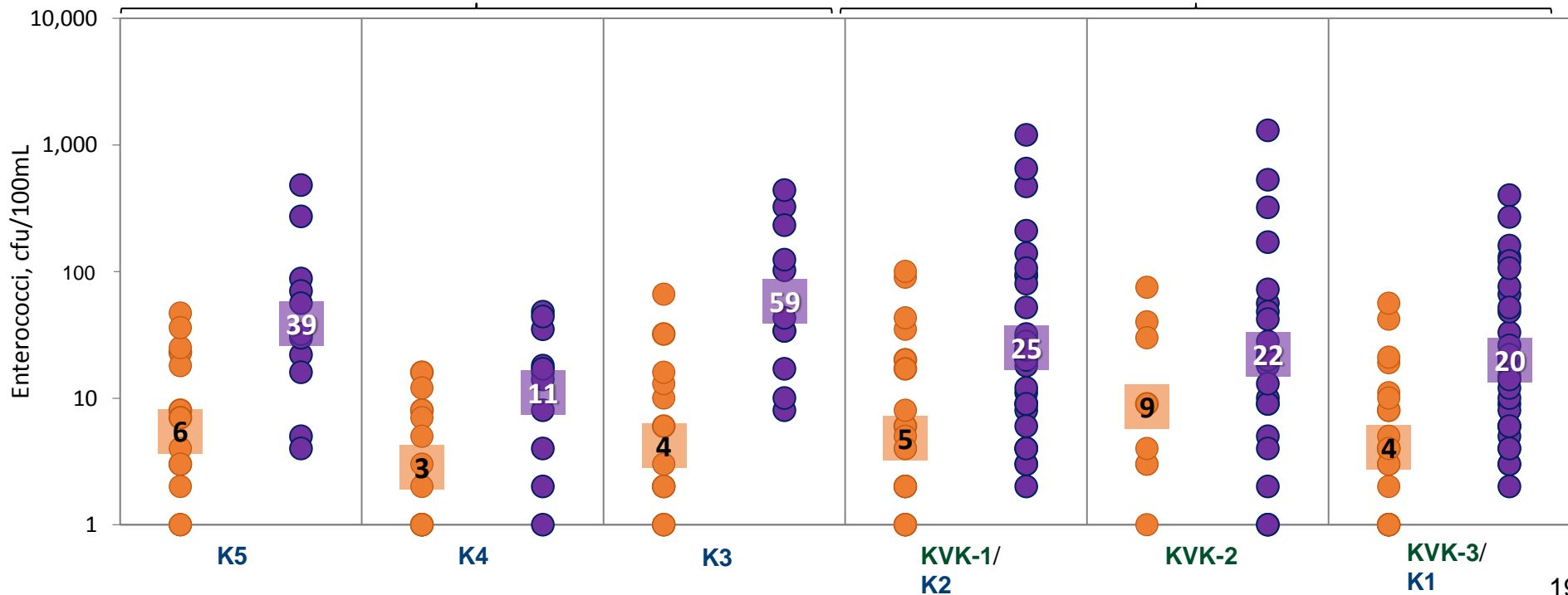
Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Oct 10 – Dec 9	3	8	26
HSM	Jan 1 – Dec 31	5	14	11

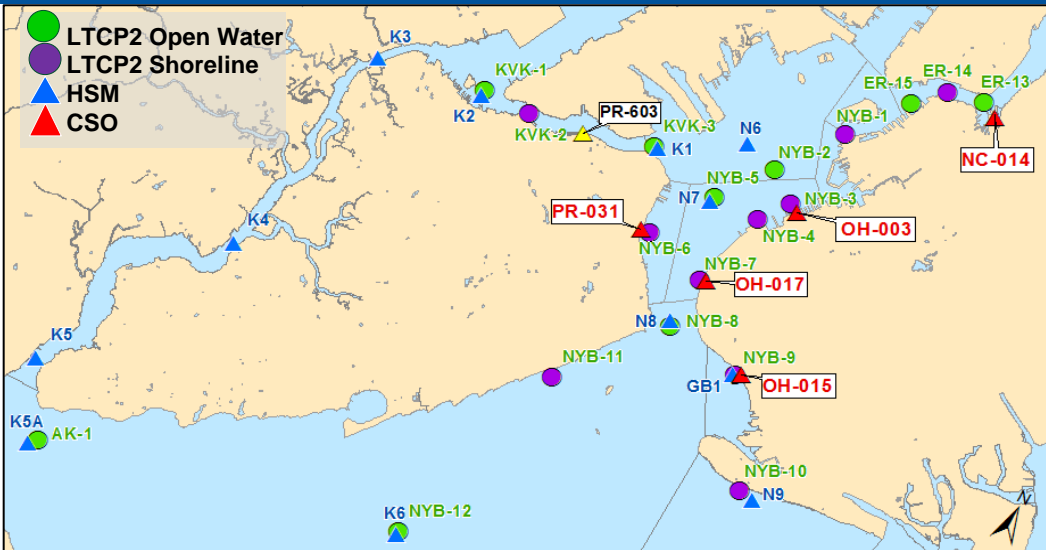


Arthur Kill

Kill van Kull

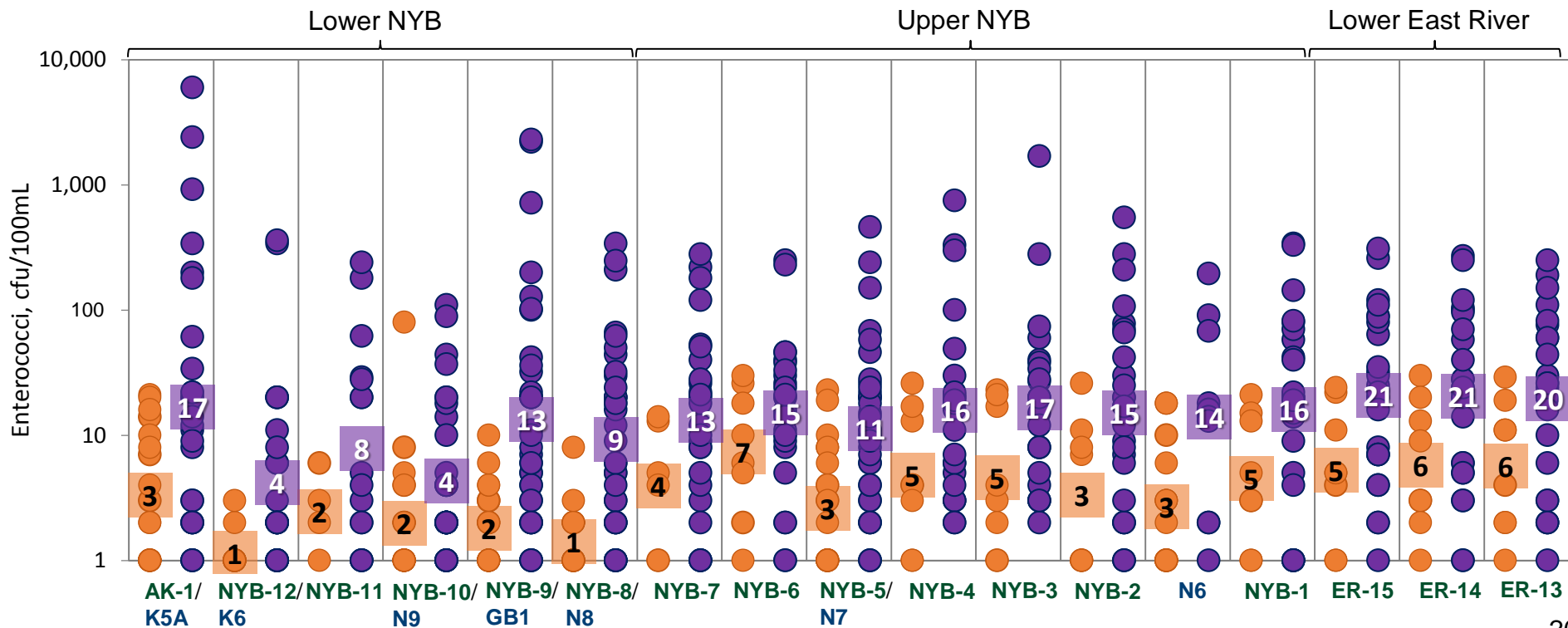
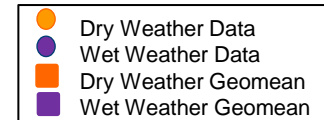


LER and NYB – Enterococci

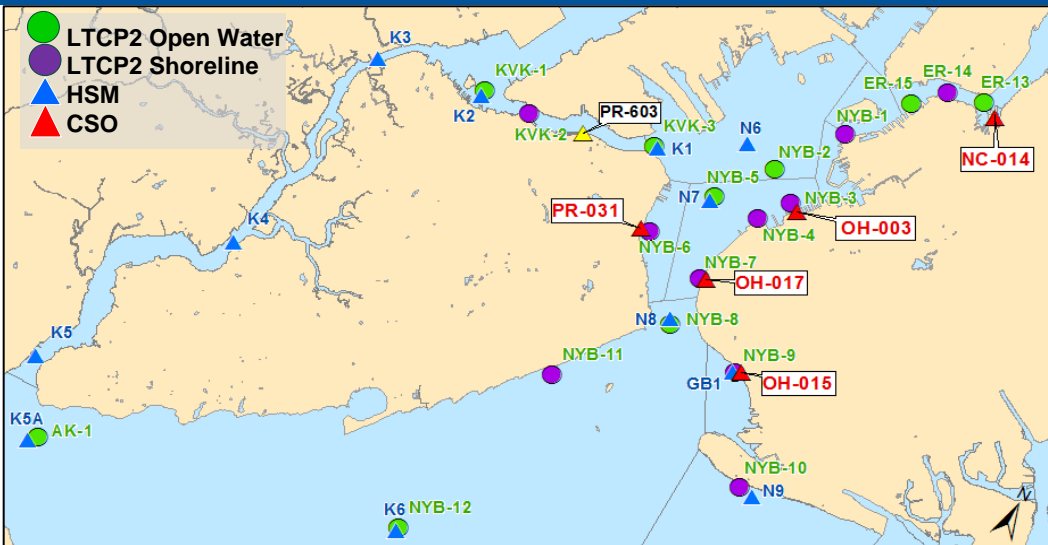


Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Oct 10 – Dec 9	16	8	26
HSM	Jan 1 – Dec 31	7	14	11



AK and KVK – Dissolved Oxygen

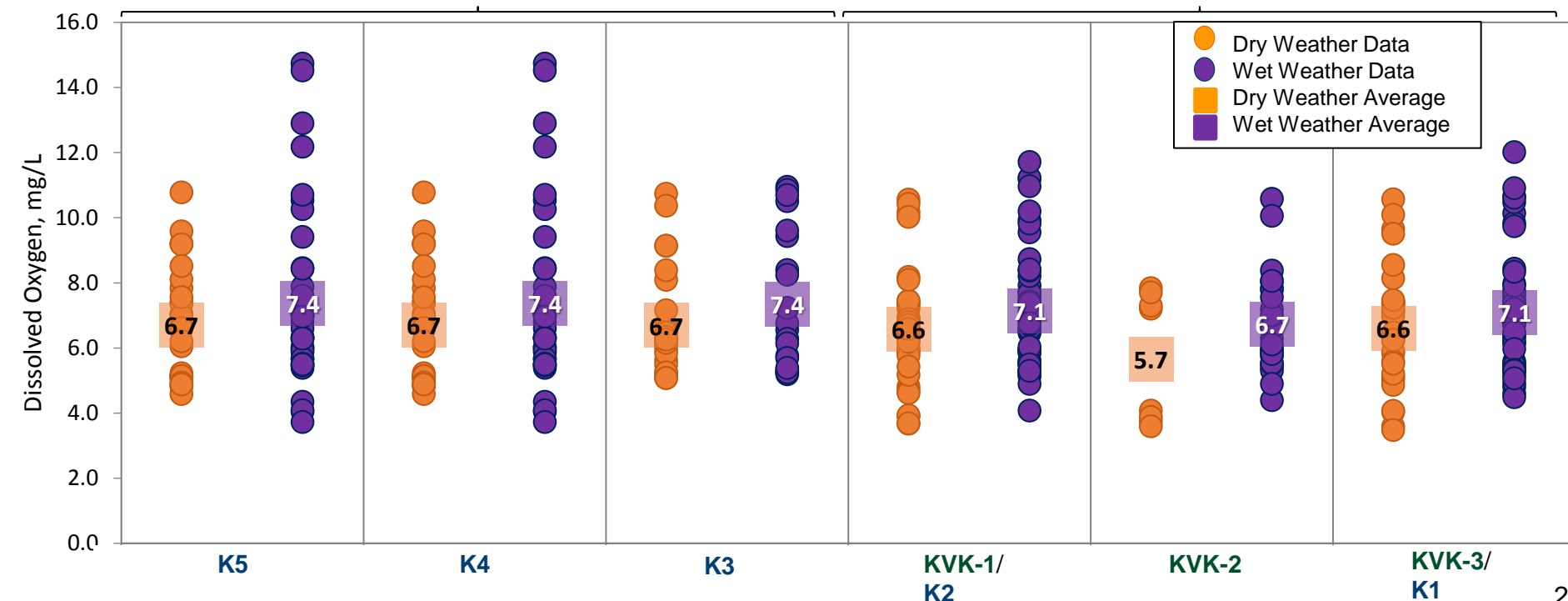


Sampling Details

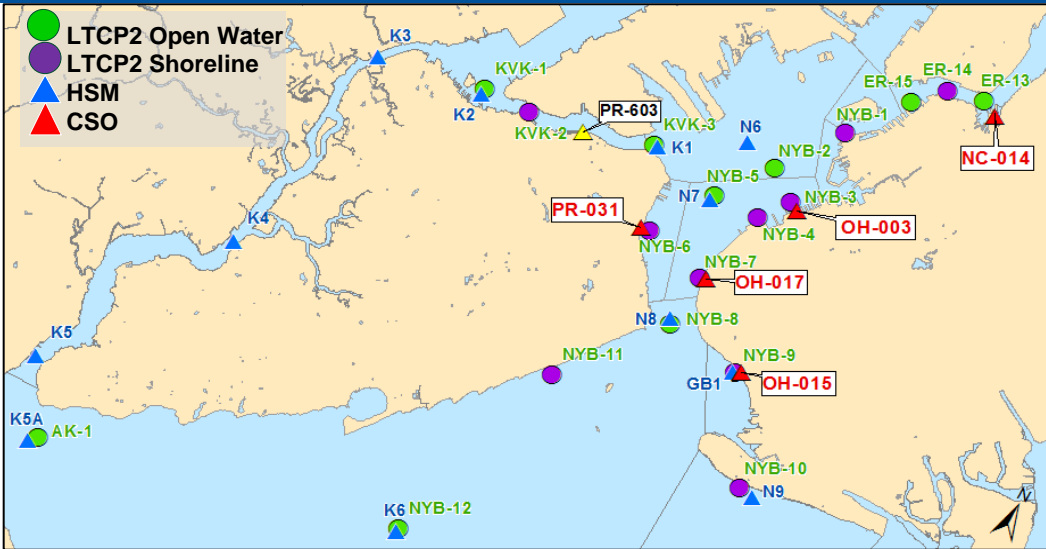
	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Oct 10 – Dec 9	3	8	26
HSM	Jan 1 – Dec 31	5	28	22

Arthur Kill

Kill van Kull



LER and NYB – Dissolved Oxygen



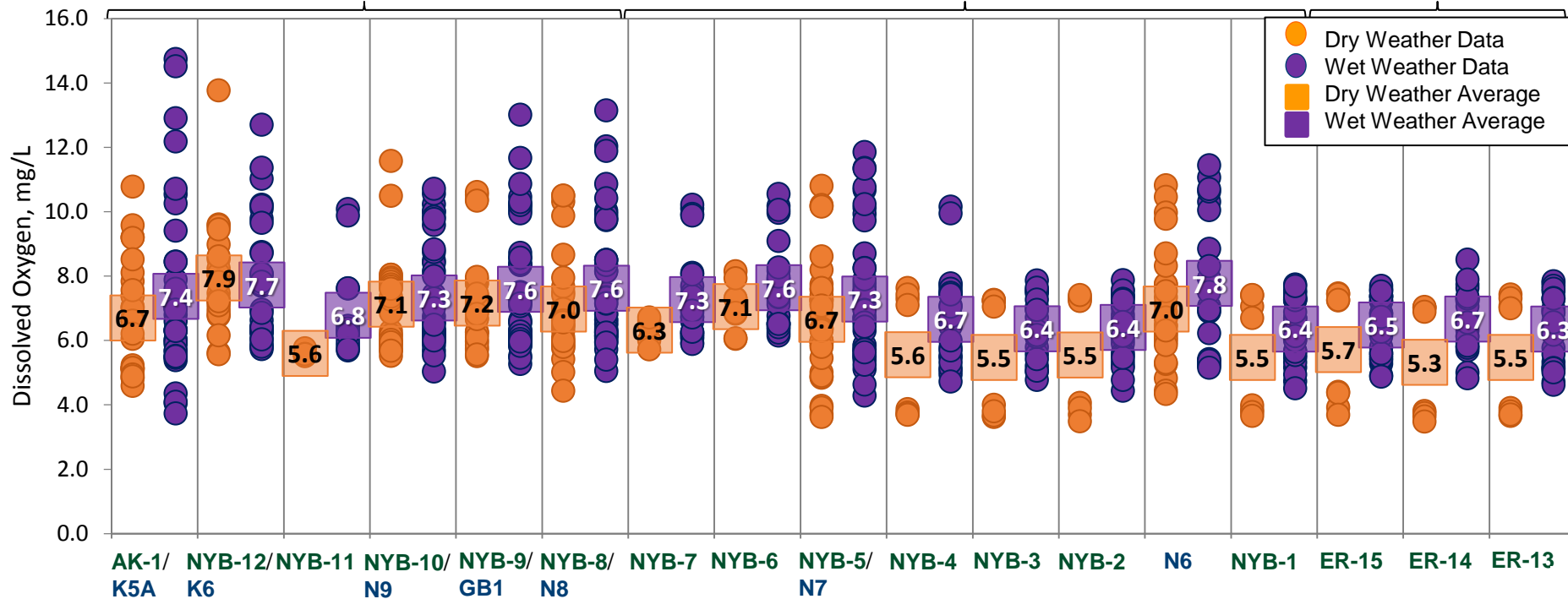
Sampling Details

	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP	Oct 10 – Dec 9	16	8	26
HSM	Jan 1 – Dec 31	7	28	22

Lower NYB

Upper NYB

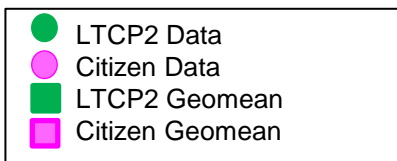
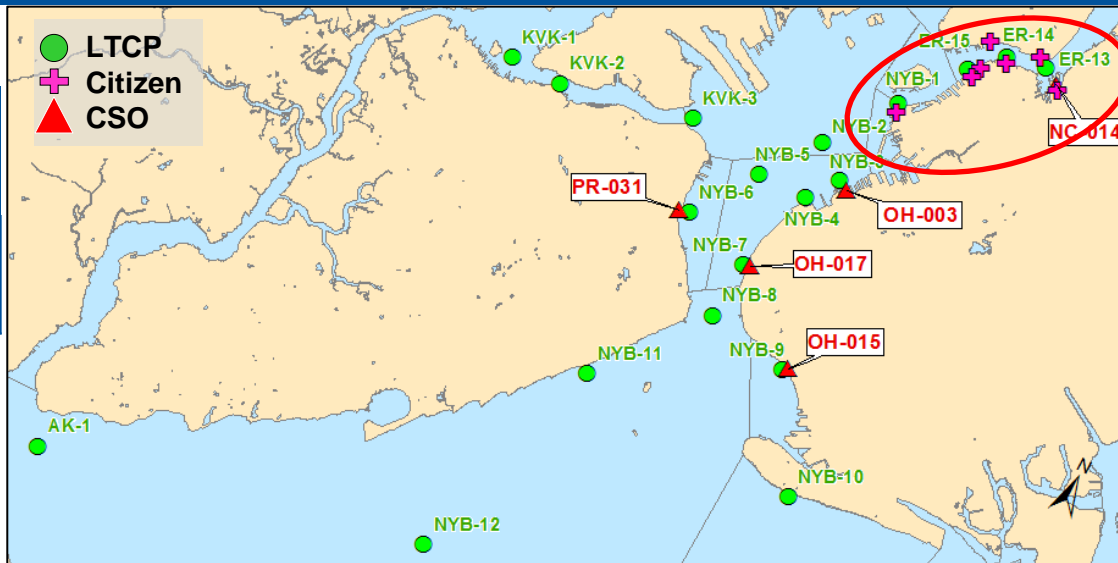
Lower East River



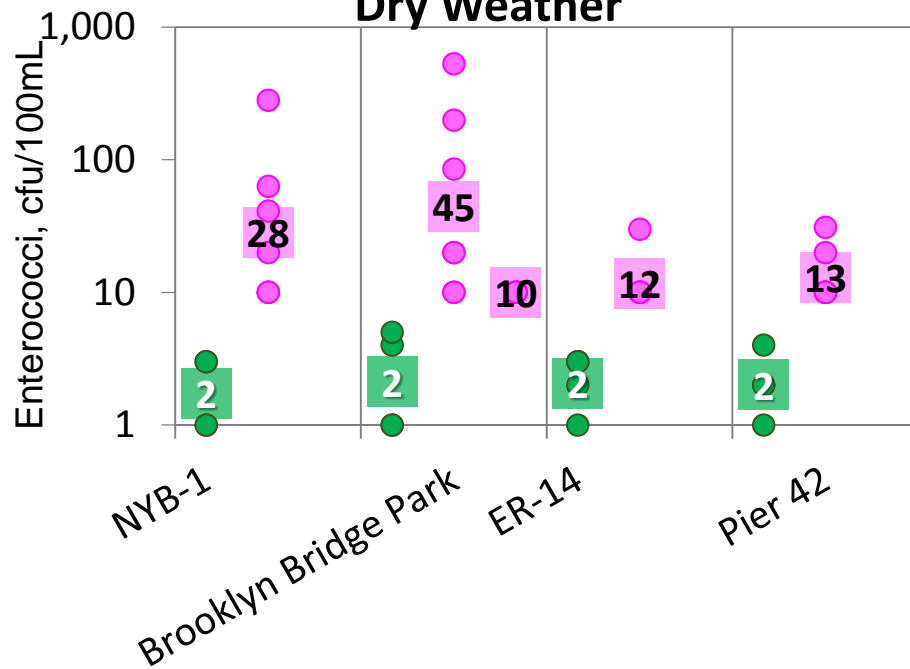
LTCP2/Citizen Comparison – Enterococci

Sampling Details

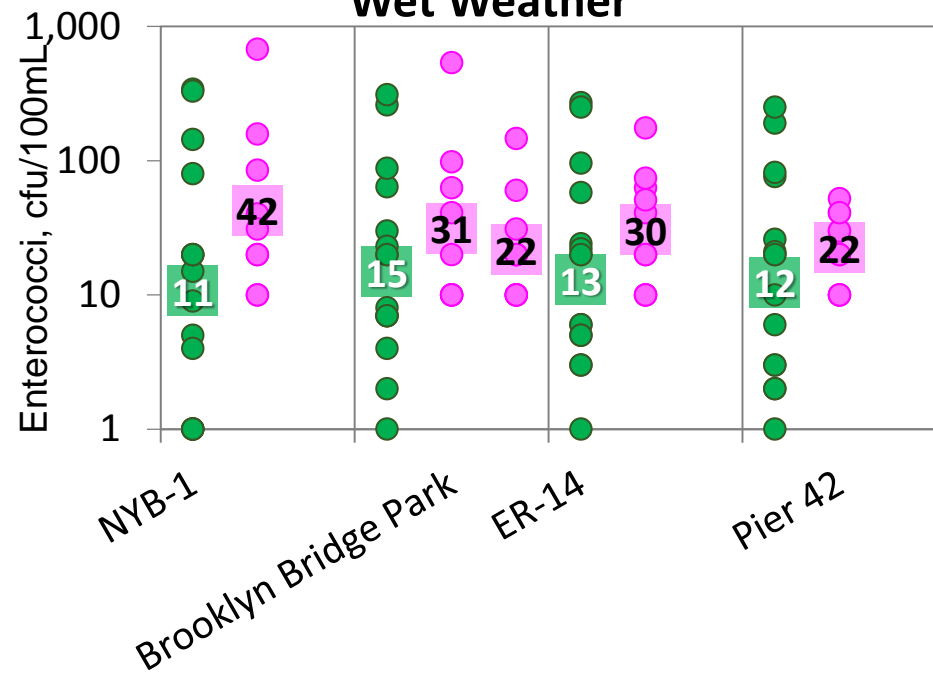
	Sampling Period (2017)	# Locations	# Samples	
			Dry	Wet
LTCP2	Oct 10 – Oct 31	4	4	16
Citizen	May 1 – Sep 31	10	13	25



Dry Weather



Wet Weather



Preliminary Gap Analysis

✓ ≥ 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.

Station	Baseline Fecal Coliform		Baseline <i>Enterococcus</i>	
	Annual Monthly GM ≤ 200cfu/100mL	Recreational Season Monthly GM ≤ 200cfu/100mL	Recreational Season Monthly GM ≤ 30cfu/100mL	Recreational Season Monthly STV ≤ 110cfu/100mL
Kill van Kull	KVK-1	✓	✓	✓
	KVK-2	✓	✓	✓
	KVK-3	✓	✓	✓
Lower NY Bay	AK-1	✓	✓	71%
	NYB-12	✓	✓	✓
	NYB-11	✓	✓	✓
	NYB-10	✓	✓	✓
	NYB-9	✓	✓	✓
	NYB-8	✓	✓	✓
	NYB-7	✓	✓	✓
	NYB-6	✓	✓	✓
Upper NY Bay	NYB-5	✓	✓	✓
	NYB-4	✓	✓	89%
	NYB-3	✓	✓	✓
	NYB-2	✓	✓	✓
	NYB-1	✓	✓	90%
	ER-15	✓	✓	91%
Lower East River	ER-14	✓	✓	87%
	ER-13	✓	✓	86%

Water Quality Improvement Projects

Grey Infrastructure

Keith Mahoney, PE
Director of Water Quality Planning
DEP

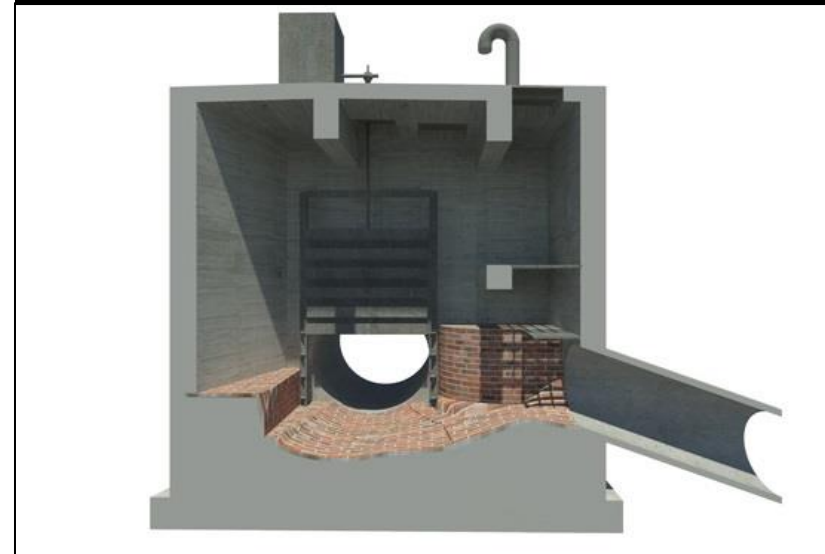
Existing Grey Infrastructure Projects

Project	Cost	Status
1 Port Richmond WWTP Throttling Facility	\$4M	Completed in June 2010
2 Outer Harbor CSO Regulator Improvements	\$4.5M	Construction Completed in July 2008
3 Inner Harbor In-Line Storage	\$10M	Construction Completed in April 2006
Total =		\$18.5M

1 Port Richmond WWTP Throttling Facility



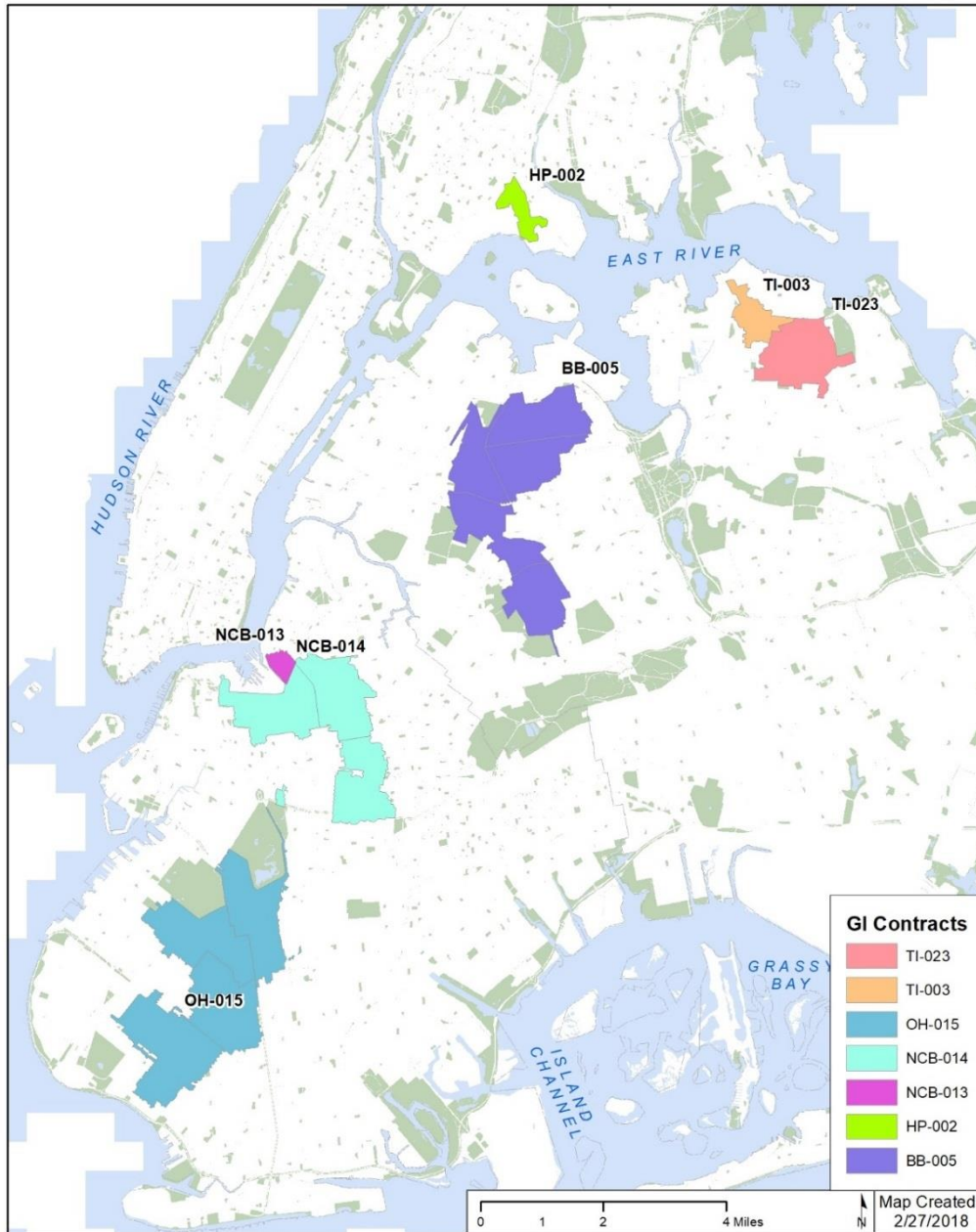
2 Regulator Improvements



Water Quality Improvement Projects

Green Infrastructure

Melissa Enoch
Program Manager, Private Incentives
DEP



Green Infrastructure Assets:

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

Public Property Retrofits in East River/Open Waters

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



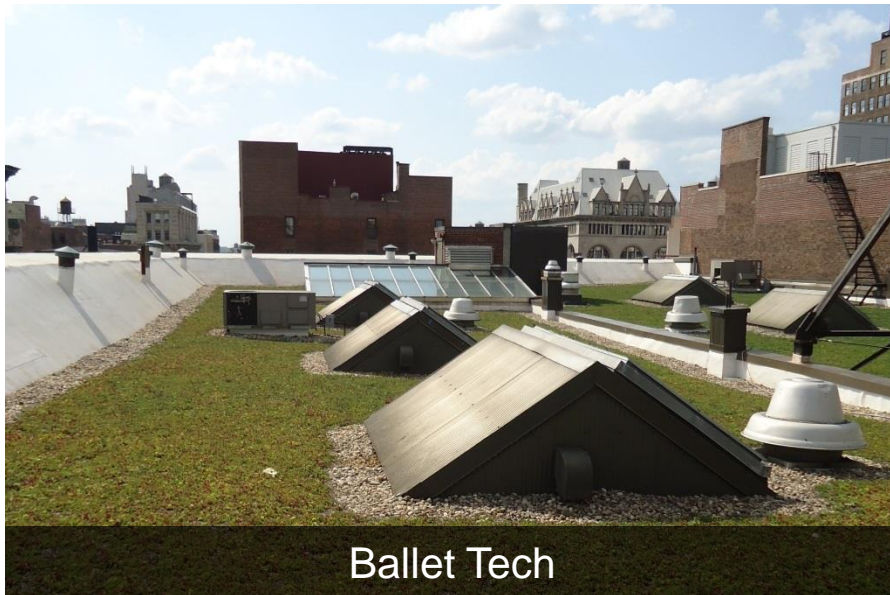
Project Status	Parks/ Playgrounds	Public Schoolyards	Total
Preliminary	1	7	8
In Design	7	4	11
In Construction	14	0	14
Constructed	9	3	12
Total	31	14	45

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



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.*

➤ **2012 Stormwater Rule:**

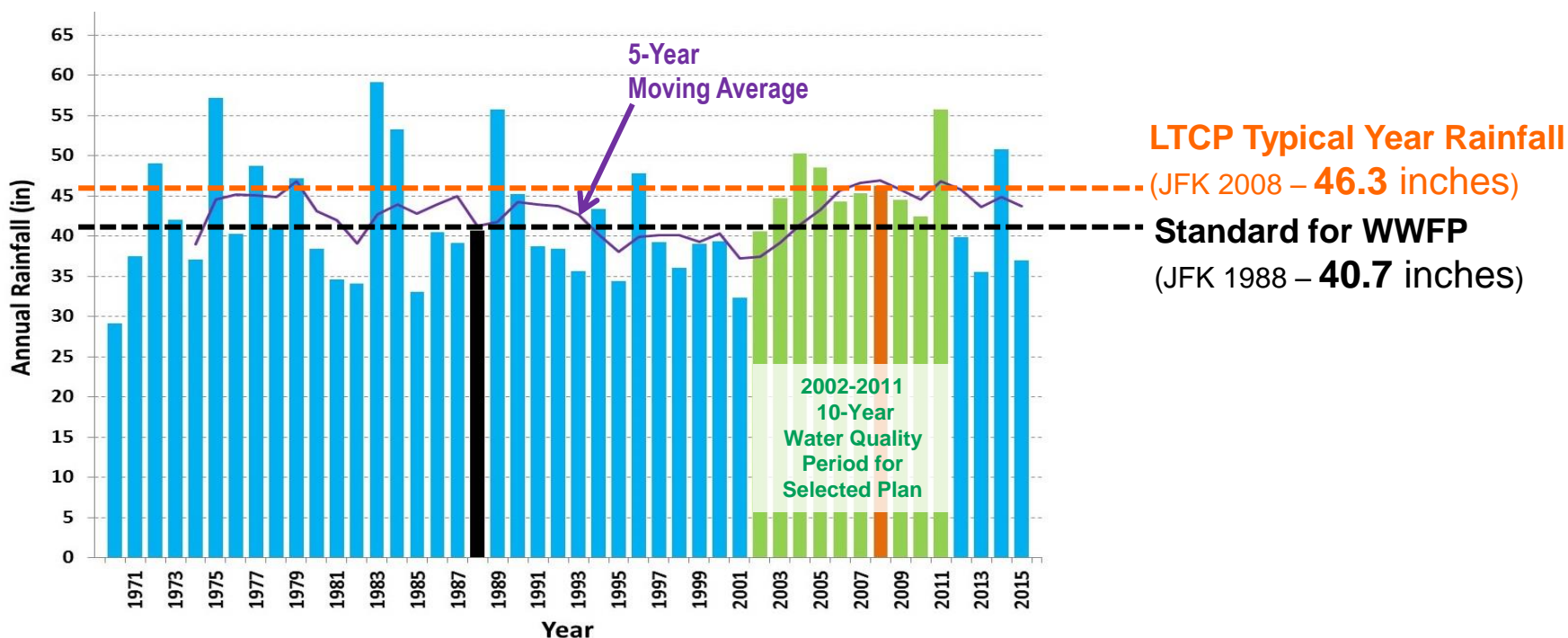
In 2012, DEP amended the allowable flow rate of stormwater to the City's combined sewer system for new and existing development. Site Connection Proposals may include green infrastructure technologies to meet the new allowable rate.

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



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

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	Outfall Disinfection	Retention Treatment Basin (RTB)		High Rate Clarification (HRC)	
		<i>Centralized:</i> WWTP Expansion			
Storage	In-System	Shaft	Tank	Tunnel	

Next Steps

Mikelle Adgate
Senior Policy Advisor
DEP

- **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

- 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