MAWAC-ENA WORKSHOP

PARIS

November
2025

2025 Update: Climate Change & Urban Water Adaptation in NYC

Welcome everyone. This presentation is an update on New York City's urban water adaptation efforts in response to climate change.

As one of the world's leading megacities, New York City (NYC) sits at the crossroads of mounting climate risks and ambitious adaptation efforts. Over the past decade (2015–2025), the city has faced accelerating climate change impacts, with strain on its extensive urban water systems.

2025 Update: Climate Change & Urban Water Adaptation in NYC

- Why This Update Matters
- Climate Forecasts: What Came True?
- Urban Water Solutions: Planned vs. Delivered
- Effectiveness - Did It Work?
- Lessons Learned
- Looking Ahead: Climate & Water in 2035
- What NYC Learned About Urban Water

Why This Update Matters

- Paris Agreement optimism vs. 2025 reality
- NYC as a megacity case study

In 2015, we were optimistic. The Paris Agreement had just been signed, and cities were beginning to plan for resilience. But in 2025, we see that climate change has moved faster than expected. NYC offers a compelling case study: complex, vulnerable, and ambitious in its response.

East Side Coastal Resiliency, Manhattan
AKRF-KSE, BIG, MNLA, One Architecture and Urbanism

Climate Forecasts: What Came True?

New York City Panel on Climate Changes (NPCC)s 2015 forecasts broadly anticipated major trends, some deviations and amplifications have been observed:

The 2015 climate projections for NYC have, in large part, been verified. If anything, impacts are manifesting with increased extremes at the local scale, and hydrological risks—especially those relating to water—increasingly dominate the city's climate adaptation challenge.

- Sea level rise: 9 inches vs. 6–8 projected
- Rainfall and heatwave intensification

Sea level rise has already exceeded projections. Rainfall events are more intense, and heatwaves are more frequent. These trends are stressing our infrastructure and demanding faster adaptation.

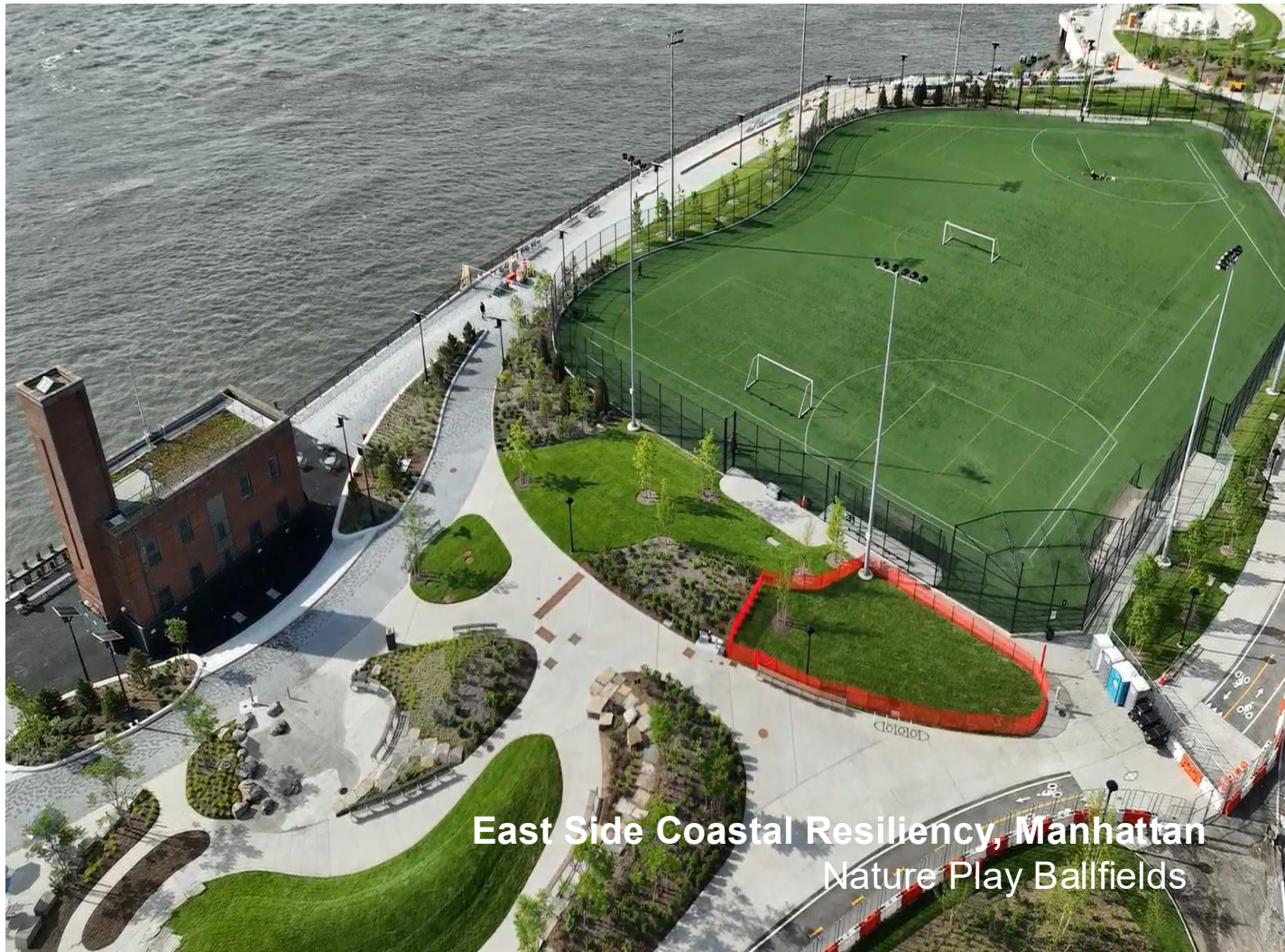
East Side Coastal Resiliency, Manhattan
Corlears Hook and Amphitheater

Urban Water Solutions: Planned vs. Delivered

Adaptation Measures:

- Bioswales exceeded targets
- ESCR delayed
- CSO reduction partial

NYC made progress—bioswale installations surpassed targets, and green infrastructure expanded. But major projects like the East Side Coastal Resiliency initiative faces delays. CSO reduction is ongoing, and housing retrofits are uneven, especially in low-income areas



East Side Coastal Resiliency, Manhattan
Nature Play Ballfields

Effectiveness:

- Green infrastructure success
- CSO and housing gaps

Some measures worked well. Green infrastructure reduced localized flooding. Open data empowered communities. But CSO events remain high, and housing resilience is lagging. We need to accelerate implementation and close equity gaps.


Rain Garden


Porous Pavement
Cloudburst management

Urban Water Solutions: Planned vs. Delivered

Adaptation Measures:

- Bioswales exceeded targets
- ESCR / BMCR in progress
- CSO reduction partial

NYC made progress—bioswale installations surpassed targets, and green infrastructure expanded. But major projects like the East Side Coastal Resiliency initiative face minor delays. CSO reduction is ongoing, and housing retrofits are uneven, especially in low-income areas

Brooklyn Bridge-Montgomery Coastal Resilience (BMCR)

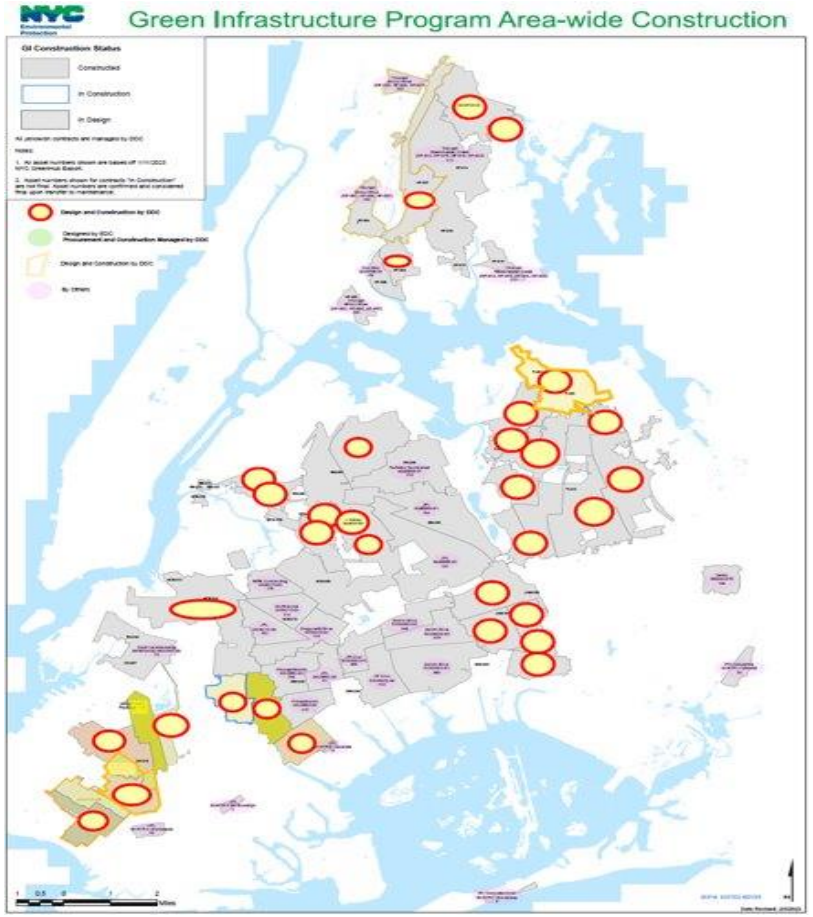
Looking Ahead: Climate & Water in 2035

2035 Forecasts:

- Sea level rise, storm intensity, equity risks

Looking ahead, NYC faces up to 1 meter (3.28 Ft) of sea level rise by 2035. Storms will be stronger, and infrastructure stress will grow. Vulnerable communities will be hit hardest unless equity is built into every adaptation strategy.

Lessons Learned:



- Integrated planning
- Community engagement
- Modular infrastructure
- Data transparency

- Four key lessons emerged: integrated planning across agencies, meaningful Community engagement, modular infrastructure that scales, and transparency through open data. These are not just technical insights—they're strategic imperatives.

Future Outlook: Urban Water Resilience in 2035 and Beyond

Looking forward, the city's climate-water adaptation depends on:

- Rapid scaling of nature-based, data-driven, and equity-anchored design.
- Iterative, flexible policymaking guided by up-to-date climate science.
- Robust funding streams and cross-sectoral coordination—public, private, and community-driven.
- Continued attention to social vulnerability, environmental justice, and transparent measurement of adaptation efficacy.

NYC's decade of intense learning and action will provide an evolving template for megacities worldwide as climate risks escalate and adaptation becomes ever more urgent.

Climate adaptation is a continuous process. NYC must lead by example, share its lessons, and collaborate globally. Resilience isn't just about infrastructure, it's about trust, equity, and urgency. The next decade will define our future.

Looking Ahead: Climate & Water in 2035

Emerging Challenges and Innovative Solutions (2025–2035)

New and Intensifying Challenges:

1. Aging Infrastructure: Systems in many neighborhoods pre-date modern climate standards; ongoing pipe bursts, infiltration, and chronic maintenance backlogs threaten adaptability.
2. Social Vulnerability and Disparity: Marginalized, low-income, and linguistically isolated communities are again projected to bear disproportionate burdens from floods and water system failures.
3. Stormwater and Sewer Overflows: Increasing rainfall intensity is projected to outpace the upgrade rate for CSO and interior stormwater systems.
4. Insurance Affordability and Market Stability: With FEMA map expansion, more property owners f ace tighter requirements and rising costs—challenging existing social equity and economic resilience safeguards.
5. Governance and Funding Complexity: As climate impacts transcend administrative boundaries, successful adaptation increasingly requires multi-level/regional/national coordination.

What NYC Learned About Urban Water

Barriers, Deviations, and Lessons

Implementation has not followed a linear or frictionless path:

- Funding shortfalls and slow disbursement (e.g., delays in full release of federal CDBG-DR grants, or pause of the NY State Mother Nature Bond Act during COVID) have contributed to the stretching of project timelines.
- Permitting and regulatory complexity remains a bottleneck for both green and gray projects—particularly any infrastructure that must cross jurisdictional or property boundaries.
- Technical challenges surfaced, for instance where old infrastructure made retrofitting risky or difficult (e.g., 19th-century water/sewer mains), requiring more intensive engineering than anticipated.
- Equity barriers: Low-income and historically marginalized neighborhoods were slower to recover; insurance costs and eligibility, combined with administrative hurdles, delayed or blocked full implementation for some homeowners and small businesses.
- Public engagement and risk perception: Surveys indicate that direct experience with disasters like Sandy leads to higher support for adaptation spending underscoring the importance of ongoing public education.

Future Challenges & Solutions

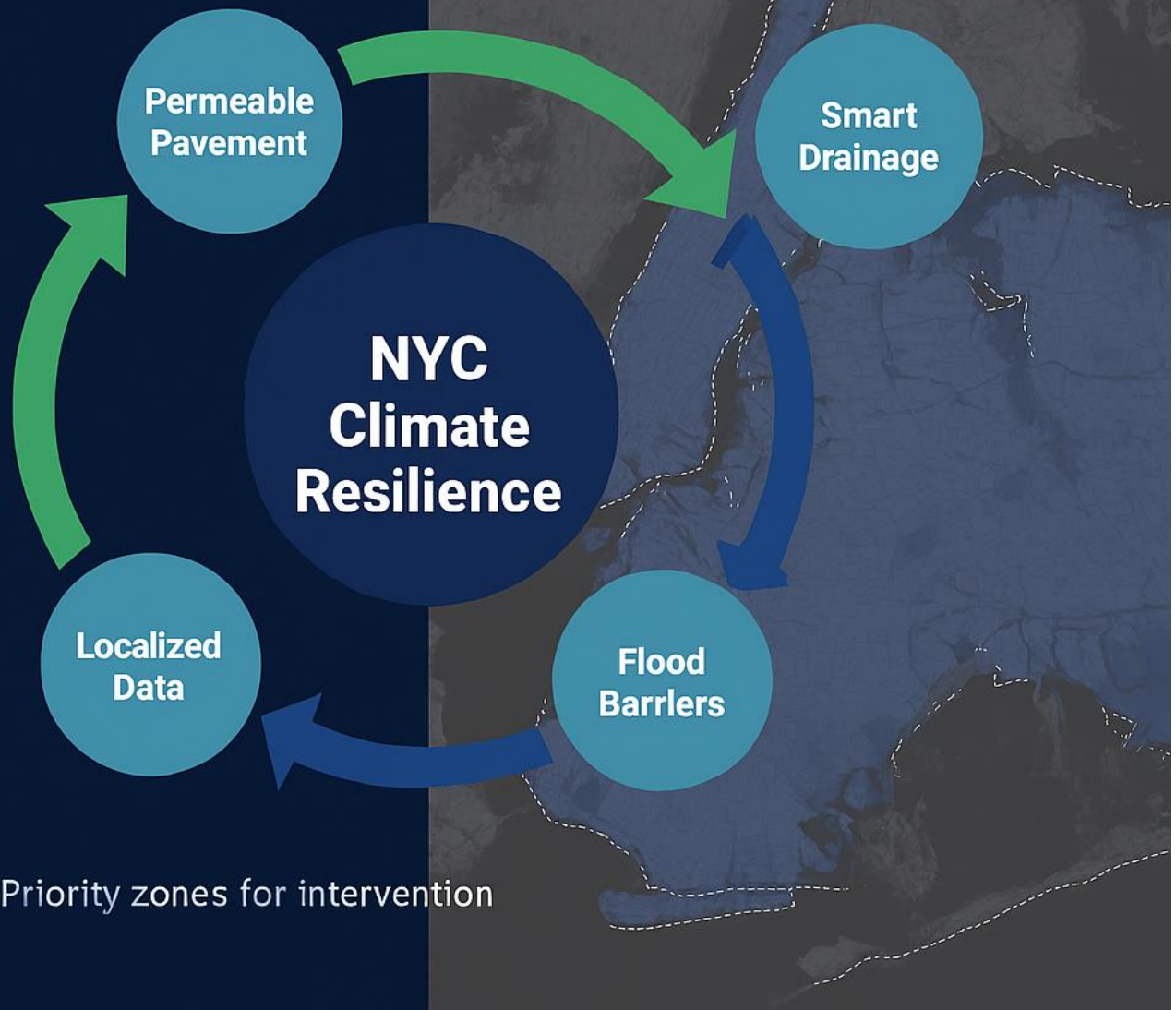
Expand Permeable Surfaces
prioritizing green roofs, permeable pavements, and tree pits

Upgrade Stormwater Systems
with smart, modular infrastructure for variable rainfall

Climate-Resilient Housing
retrofit flood-prone buildings

Sovereign Cloud for Water Governance
managing localized data

Equity-Driven Planning
Ensure investments prioritize underserved communities



Priority zones for intervention

NYC is building resilient infrastructure for a changing climate.

NYC COASTAL RESILIENCY PROJECT PORTOFLIO

- **East Side Coastal Resiliency (ESCR)**
- *Montgomery St to 23rd St*

- **Brooklyn Bridge Montgomery Coastal Resiliency (BMCR)**
- *Montgomery St to Brooklyn Bridge*

- **Red Hook Coastal Resiliency (RHCR)**
- *Atlantic Basin and Beard St*

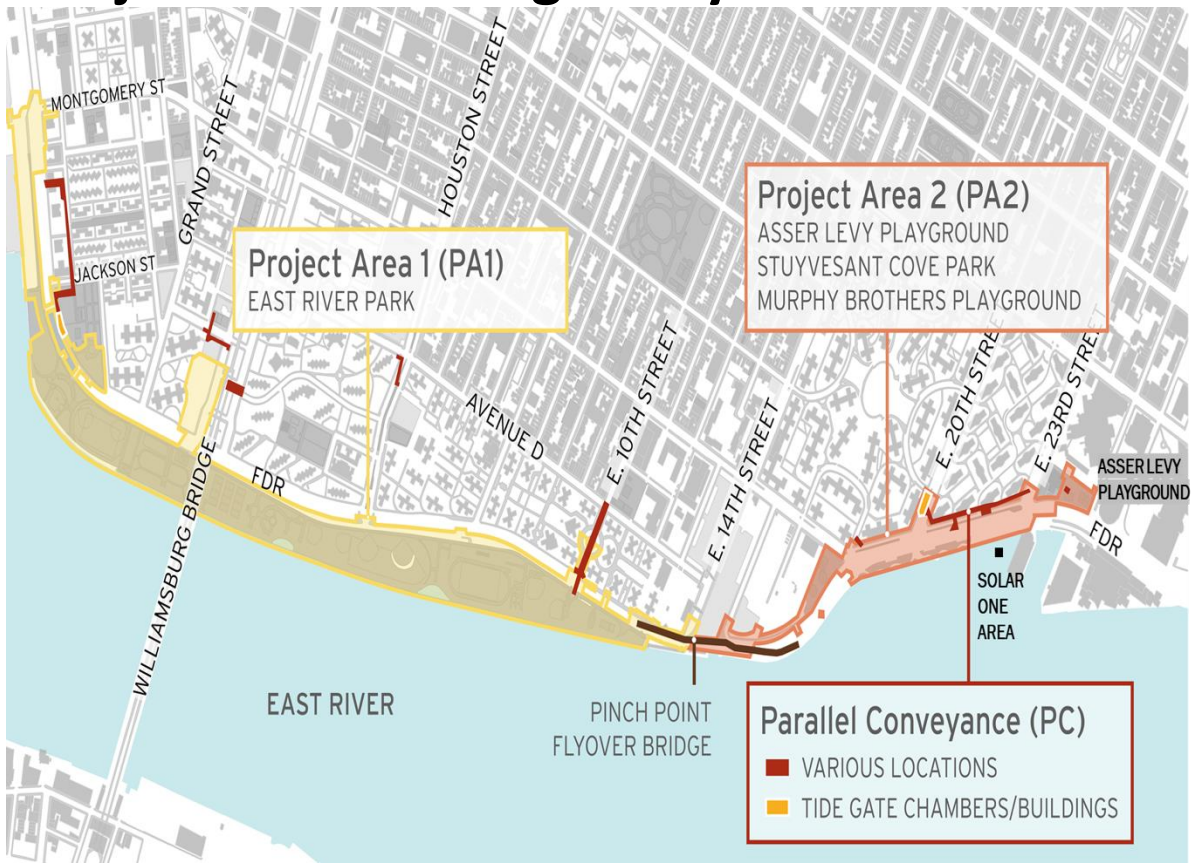
- **Bellevue Campus Coastal Resiliency (BCCR)**
- *25th St to 30th St*

- **Greenway - Esplanade**
- *East River Park to 15th St*

NYC EAST SIDE COASTAL RESILIENCY (ESCR)

- **$1.45 Billion** total budget: $338M HUD CDBG-DR award, $1.1M local City match
- 2.4-mile flood protection system, includes raised parkland, floodwalls, floodgates and infrastructure improvements
- Height of the flood protection ranges from 8-9 feet above existing grade
- Three construction packages PA1, PA2, PC
- Design 2011-2019, Construction completion anticipated 2026

Project Area: Montgomery St to E. 23rd

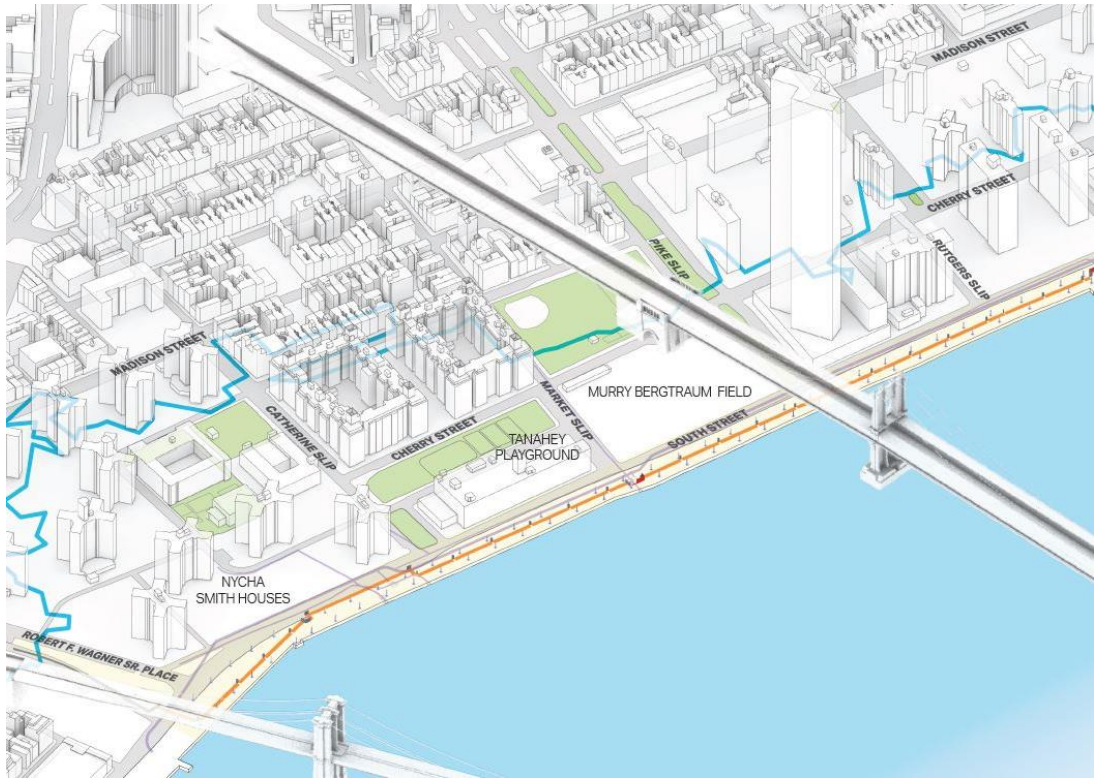


NYC EAST SIDE COASTAL RESILIENCY (ESCR)

NYC BROOKLYN BRIDGE MONTGOMERY COASTAL RESILIENCY (BMCR)

- **$522 Million** total budget: $172M HUD CDBG-NDR, $350M local City match
- Designed to protect from a 100-year storm surge
- Includes a combination of floodwalls, flip-up gates, swing gates and roller gates
- Design completed late-2021, currently in procurement
- Construction to begin Fall 2022

Project Area: Brooklyn Bridge to Montgomery St



NYC BROOKLYN BRIDGE MONTGOMERY COASTAL RESILIENCY (BMCR)

NYC RED HOOK COASTAL RESILIENCY (RHCR)

- **$100 Million** total budget: $50M FEMA HMGP award, $50M local City match
- Feasibility study completed in 2017
- Proposing elevation 10-ft protection with active deployable features, in addition to passive elevation 8-ft protection
- Incorporate the Brooklyn Waterfront Greenway
- Design began late-2019, completion by late-2023
- Construction anticipated to begin in mid-2024

Project Area: Atlantic Basin and Beard St.

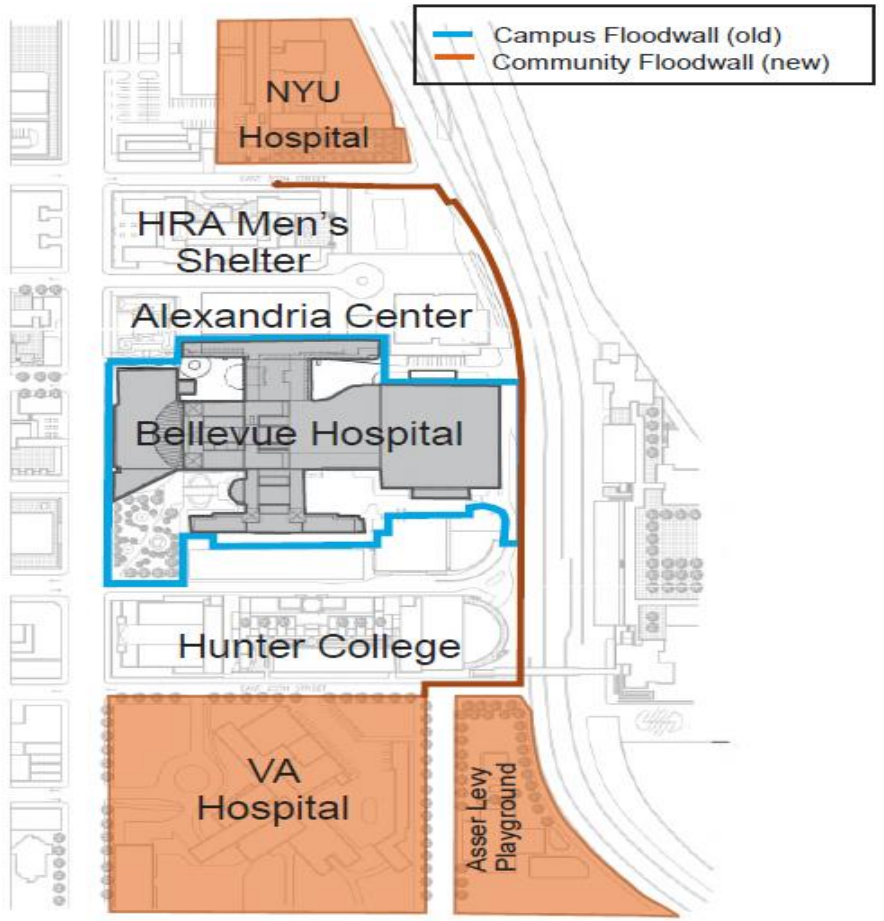
NYC RED HOOK COASTAL RESILIENCY (RHCR)

PROPOSED CONDITIONS

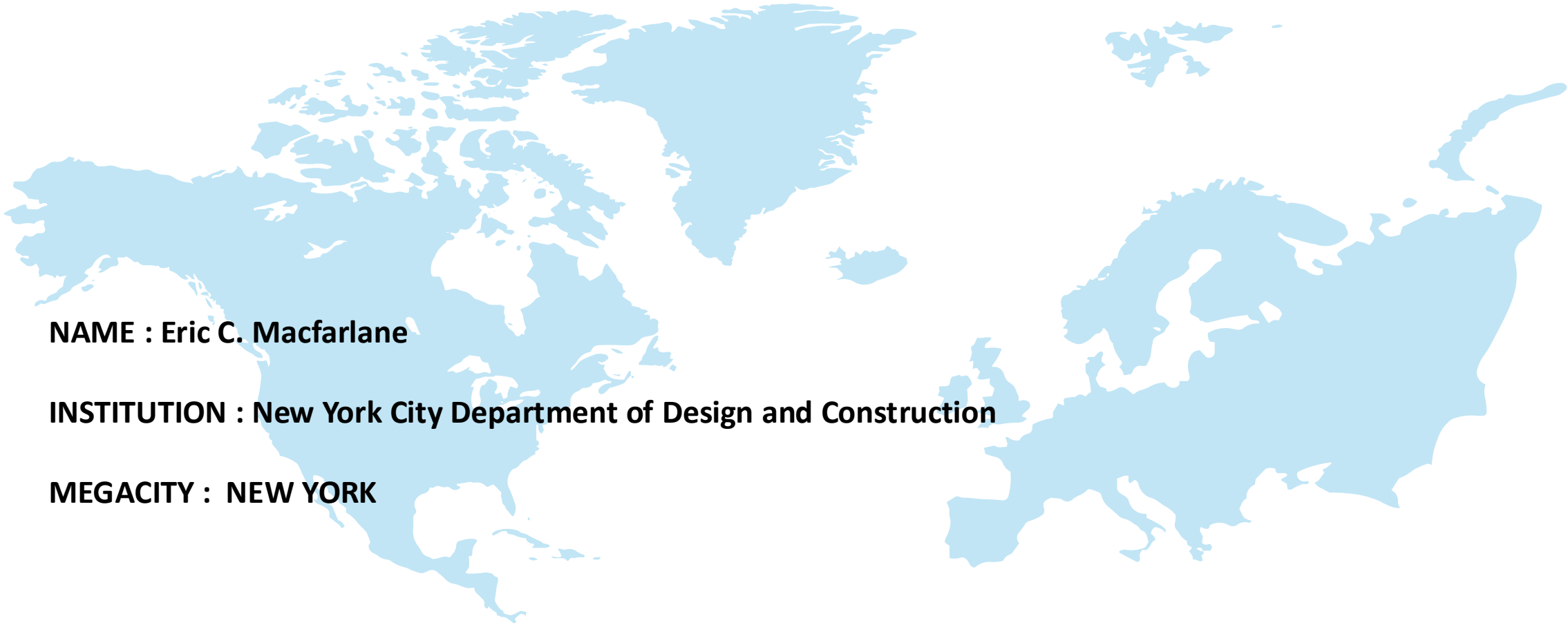
Bellevue Coastal Resiliency (BCCR)

- **$247 Million** total budget: FEMA PA Grant with 90/10 local City match
- Floodwall EL. +17 to +19 Feet
- Storm surge: 500-yr storm with 2080s sea level rise
- Design start Spring-2022, completion by end-2024
- Construction anticipated to begin in mid-2027

Project Area: FDR Dr., E. 25th St. to E. 30th St.



Thank you for your attention



NAME : Eric C. Macfarlane

INSTITUTION : New York City Department of Design and Construction

MEGACITY : NEW YORK

MAWAC- ENA PARIS
2025