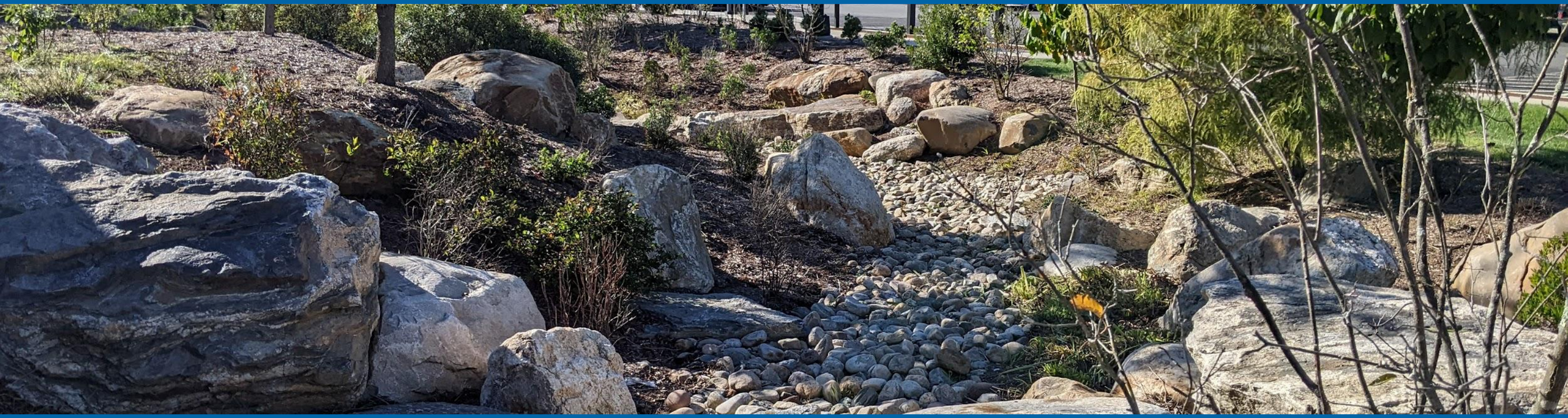
LONG ISLAND SOUND PARTNERSHIP

Sea Grant CONNECTICUT

Sea Grant NEW YORK



Using Nature-Based Solutions for Resilience:

A Panel Discussion on Common Challenges & Strategies for Success

Long Island Sound Sustainable & Resilient Communities 4th Annual Workshop

Thursday, December 4, 2025

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Workshop Etiquette

Please keep your microphones muted. Keep your camera off too!

Workshop will be recorded and made available to attendees afterward

We will be using interactive polls to gather feedback

Use the chat for questions for speakers or for help with technical issues

Welcome

Plan for this Session

This will be an interactive session - be ready to participate!

- Welcome
- Nature-Based Solutions Introduction
- Panel Discussion
- Q&A with Audience

Poll Instructions

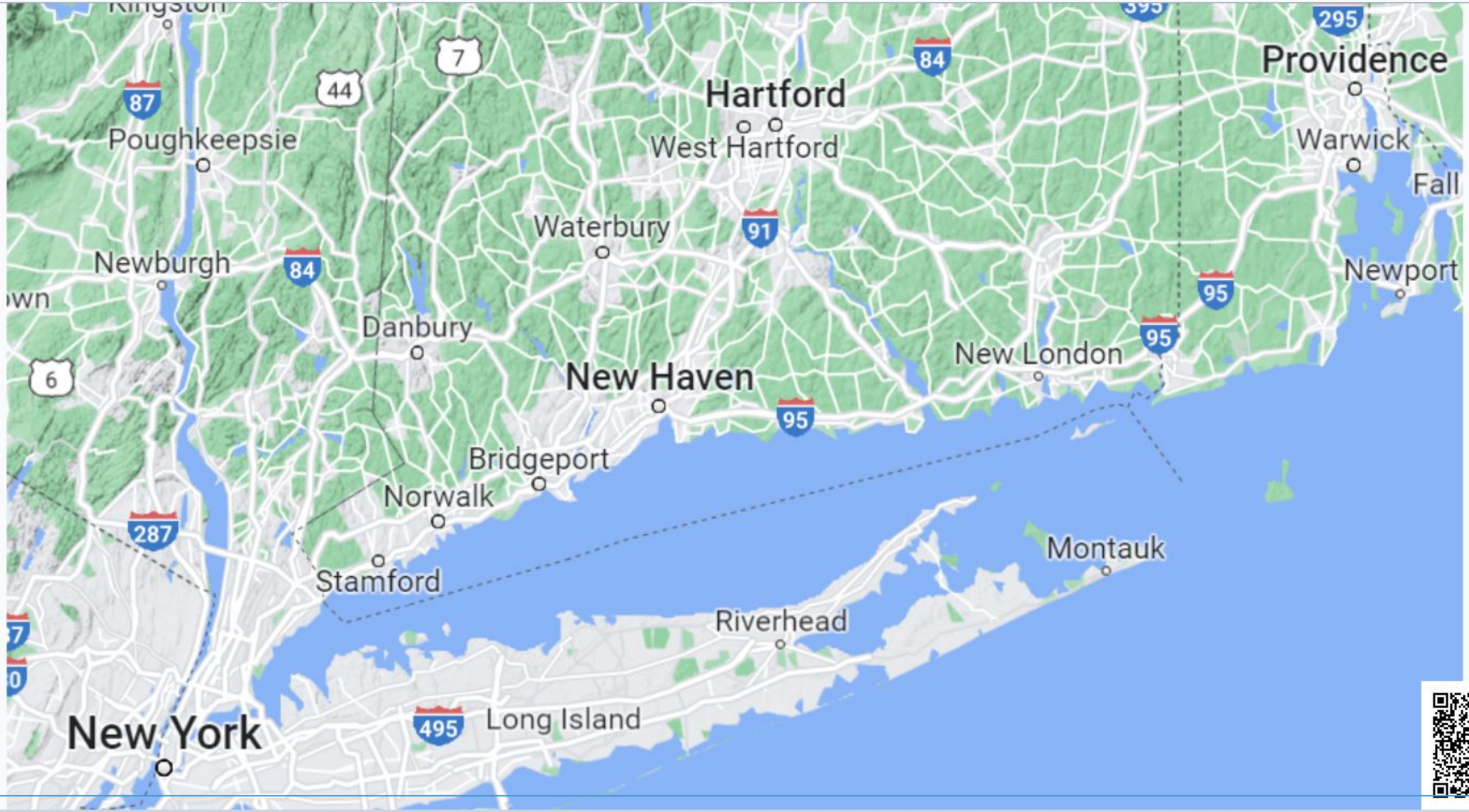
Via the web: at pollev.com/lisres

Via text message: text LISRES to 22333 to join the session. Once you receive confirmation you've joined the session, you can text the letter that corresponds with your answer.

Please note that the map only works via the web!

Poll Everywhere

Where are you joining us from today?

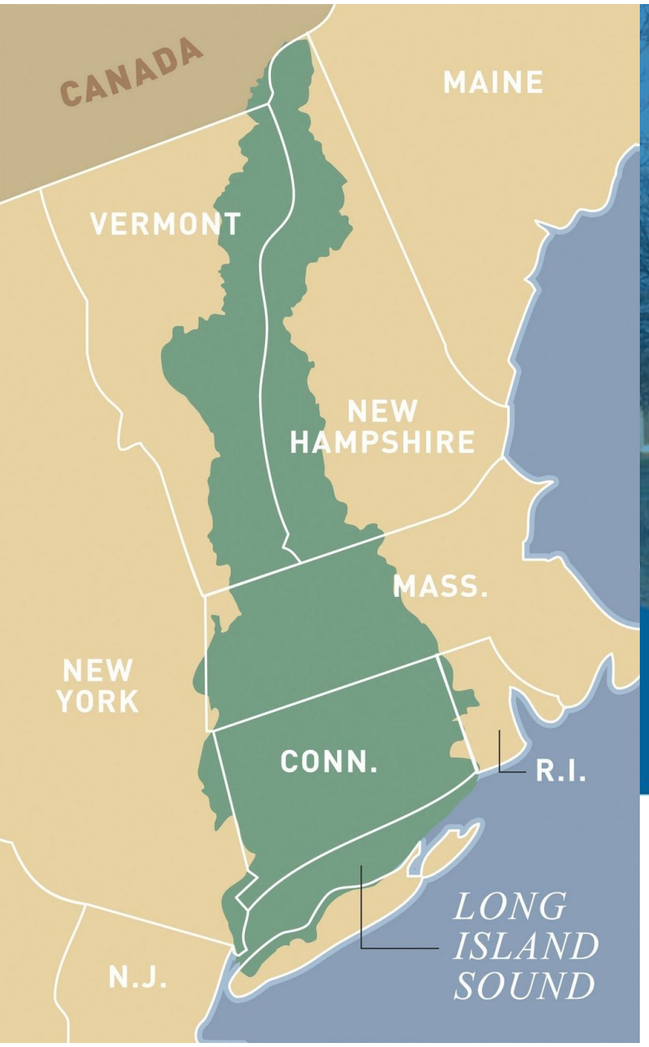


Please indicate the sector that best represents you:

0

Federal or state government	0
Indigenous Nation or community	0
Local government	0
Nonprofit/NGO	0
Watershed organization	0
Community group	0
Consultant	0
Academia	
Interested individual	

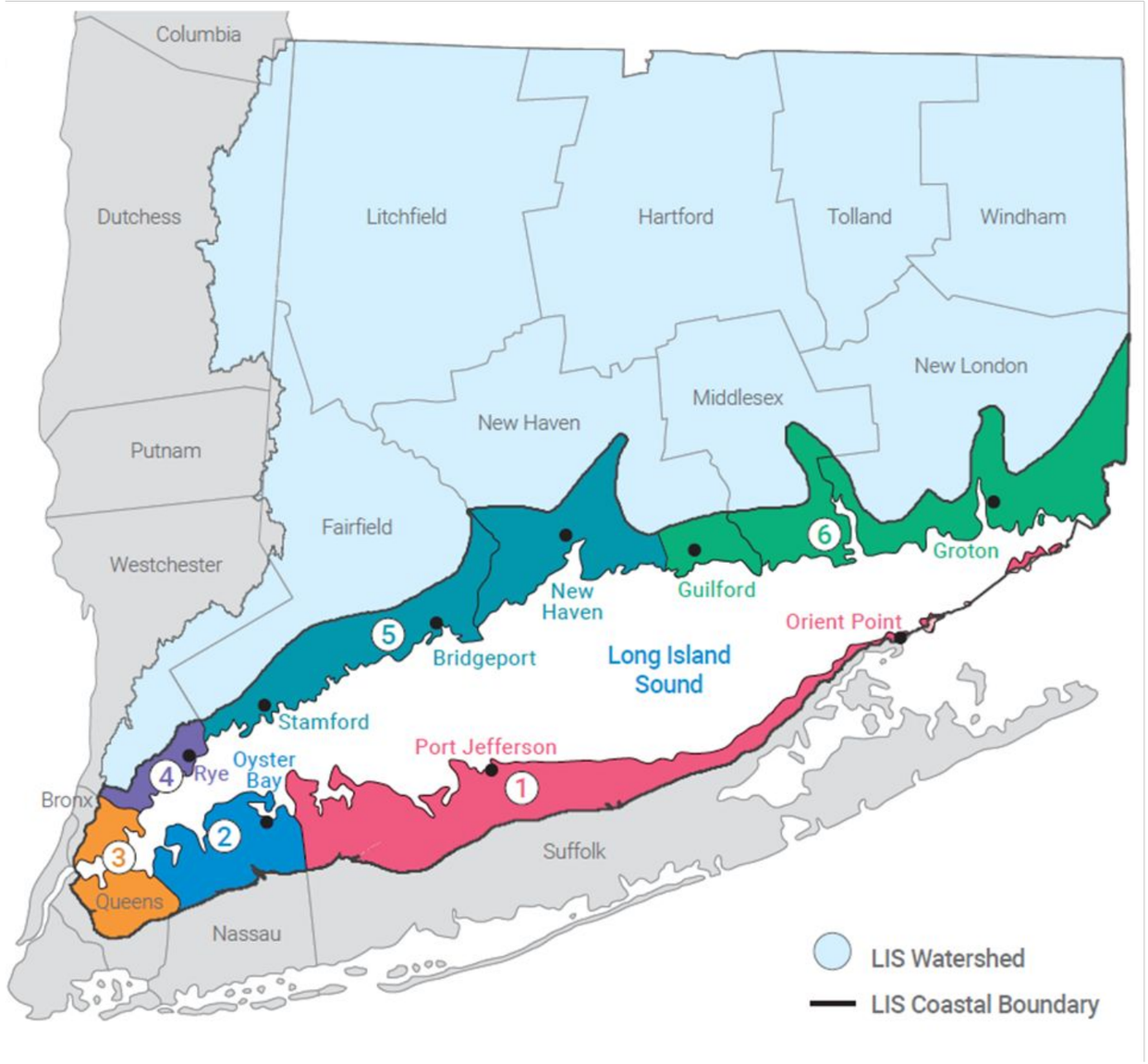
Long Island Sound Partnership



WHO WE ARE

The **Long Island Sound Partnership** is a collaborative effort involving researchers, regulators, user groups, and other concerned organizations and individuals. We are working together to protect and improve the health of the Sound.

The SRC Extension Professionals Team



1 **Suffolk County**
Elizabeth Hornstein

2 **Nassau County**
Sarah Schaefer-Brown

3 **NYC - Bronx & Queens**
Ben Goldberg

4 **Westchester County**
Sara Powell

5 **Western CT**
Deb Visco Abibou

6 **Eastern CT**
Sarah Schechter

SRC Goal & Objectives in the 2025 CCMP

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Goal:

Empower Long Island Sound communities to plan for and respond to environmental challenges in ways that prioritize well-being for all.

Informed Decision-Makers

Grow the number of government, practitioner, and community leaders receiving training and support to increase their capacity to adapt to environmental challenges.

Community-Driven Resilience Planning

Increase the number of municipalities that identify key resilience priorities through local or regional community-driven planning processes.

Resilience Initiative Implementation

Implement initiatives to improve community resilience to flooding and other environmental challenges.

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An Introduction to Nature-Based Solutions

What is your familiarity with Nature-Based Solutions (NBS)?

0

Not very familiar - I'm here today to learn more.	0%
Somewhat familiar - I'm interested to possibly use them in my community.	0%
Very familiar - I'm actively planning to use NBS in my community.	0%
Expert - I'm a practitioner/have experience implementing NBS.	

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What are ***Nature-Based Solutions (NBS)***?

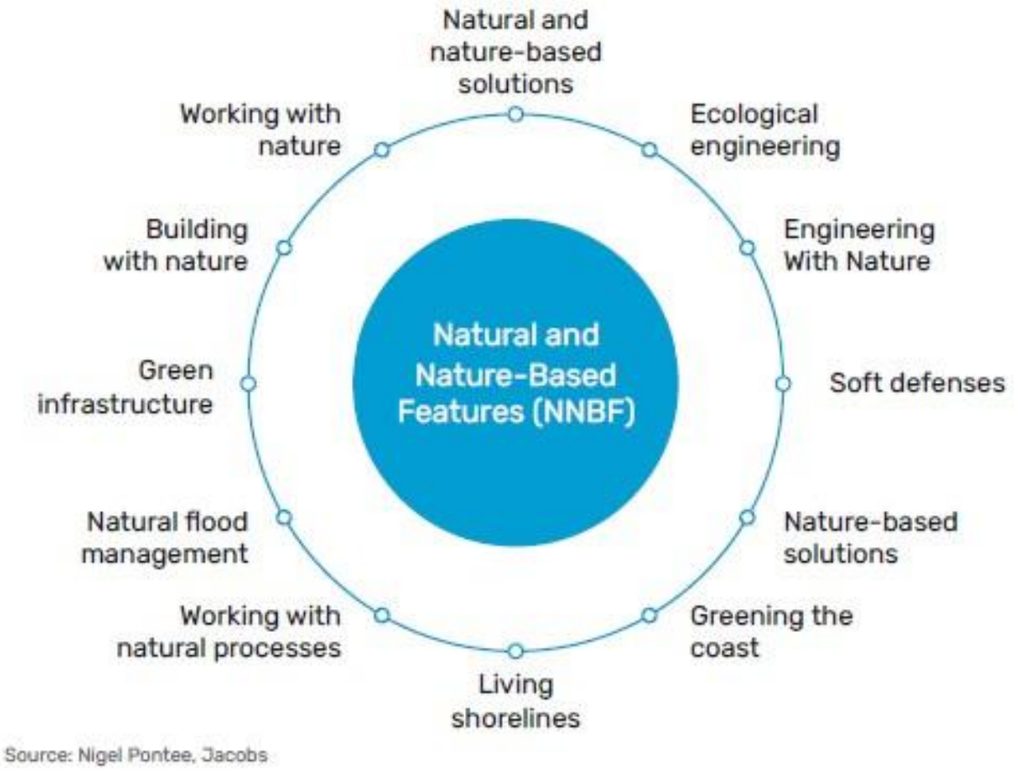
FEMA Definition

*Sustainable planning, design, environmental management, and engineering practices that **weave natural features or processes into the built environment** to build more resilient communities.*

EPA Definition

*Actions that **protect, conserve, restore and sustainably manage** natural or modified ecosystems… and use natural features or processes to address public health and environmental challenges while providing **multiple benefits** to people and nature.*

Related Concept: Natural and Nature-Based Features (NNBF)



Source: USACE (2021)

<u>US Army Corps</u> Definition

- **NNBF:** Use of landscape features for flood risk management
- Coastal application emphasis
- **Nature-based features** *mimic* natural processes to provide services

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Related Concept: **Green Infrastructure (GI)**

<u>Clean Water Act</u> Definition	"Measures that use plant or soil systems… permeable surfaces, … stormwater harvest and reuse, or landscaping to **store, infiltrate, or evapotranspirate** stormwater and **reduce flows** to sewer systems or to surface waters" (Source: EPA)

Also referred to as *Green Stormwater Infrastructure (GSI)*

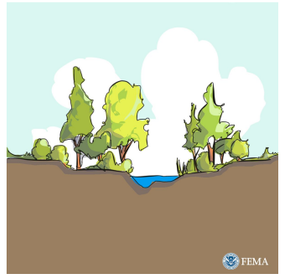
Broad Applications of NBS around Long Island Sound

Coastal Resilience

Examples:

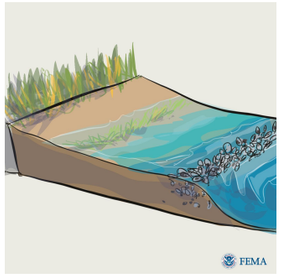
Wetland Restoration

Living Shorelines



Floodplain Restoration

Dunes



Oyster Reefs

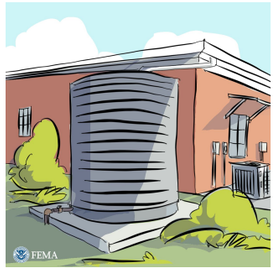
Stormwater Management

Examples:

Rain Gardens & Bioswales

Green Roofs

Permeable Pavement



Rainwater Capture

Urban Forestry

Adapted from FEMA Nature-Based Solutions Guide (Source: FEMA Media Library)

A Pathway to Resilience - Ecosystem Services & Co-Benefits of NBS

Ecosystem Services

Benefits that communities derive from the natural environment, including clean air, water, food, economic activity, and health.

(EPA, 2025)

Oyster Restoration

Rain Garden

Urban Agriculture

- Manage and restore soils to reduce emissions and sequester and remove carbon
- Provide cooling
- Support biodiversity
- Increase access to cultural ecosystem services
- Reduce runoff after storm and extreme precipitation events
- Protect from erosion
- Contribute to healthy food systems
- Improve water quality

Source: Fifth National Climate Assessment (NCA5)

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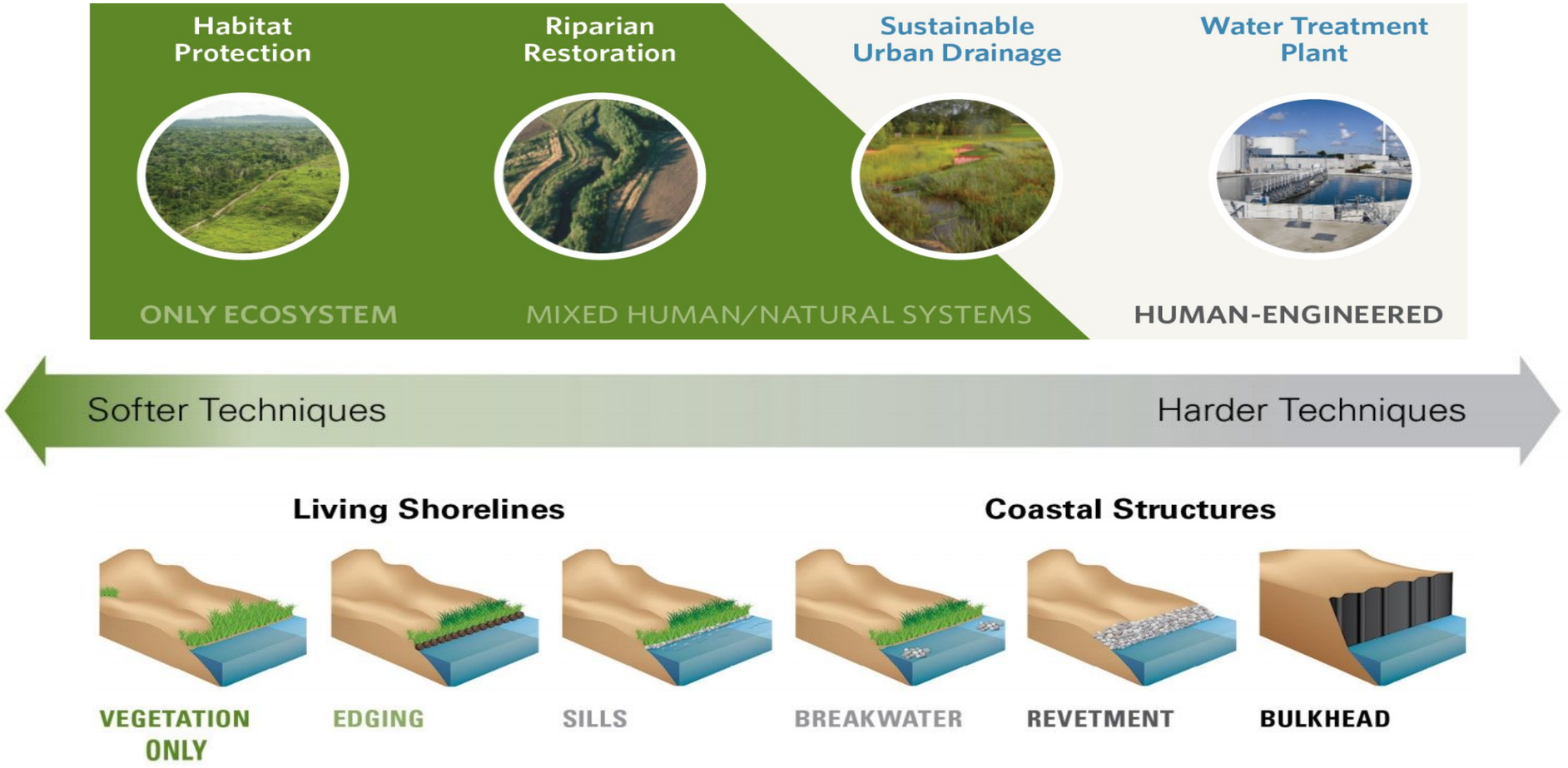
Green-Grey Infrastructure Spectrum



Adapted from FEMA & TNC

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Mounting Evidence of Success

$23.2 Billion in Storm Protection

Coastal wetlands in the U.S. are estimated to provide $23.2 billion in storm protection services every year.[1]

$7 Saved for every $1 spent

Wetland and reef restoration in the Gulf of America can yield benefit-to-cost ratios greater than seven to one — or seven dollars in flood-reduction benefits for every dollar spent on restoration.[2]

$99,000 Worth of Services

Approximately 2.5 acres of restored or protected oyster reefs can provide up to $99,000 worth of services every year. In addition to shoreline stabilization, these reefs improve water quality.[3]

Cost savings of NBS (Source: NOAA Office for Coastal Management)

Living Shoreline in Fenwick, CT

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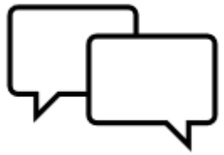
Mounting Evidence of Success

"According to a 2014 journal article in Ocean & Coastal Management, North Carolina properties with ***natural shoreline protection measures withstood wind and storm surge*** *during Hurricane Irene (2011)* ***better than properties with seawalls or bulkheads.*** *The storm damaged 76 percent of bulkheads surveyed, while there was no detected damage to other shoreline types."*

Source: FEMA, 2020

Goals of Today's Panel

Hear from practitioners who have experience with NBS in the Long Island Sound region



Discuss best practices and share challenges/successes of NBS implementation

Explore when it is (or isn't!) appropriate to incorporate NBS into planning and projects

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Introducing Today’s Panelists

Susanne Boyle, RLA, ASLA

Principal Landscape Architect, NV5

- Grounded in her early career in landscape construction, Susanne brings a practical understanding of implementation to every project—bridging design innovation with constructability.
- NV5 is a multidisciplinary engineering firm, committed to advancing environmental sustainability & resiliency across all sectors of its practice.
- Susanne’s work at NV5 focuses on sustainable, nature-based solutions that enhance ecological health and community resilience.

Alan Cohn

Senior Policy & Science Advisor to the Deputy Commissioner of Sustainability
New York City Dept of Environmental Protection

- Leads efforts to prepare water systems for climate change and population growth through partnerships and financial incentives.
- **Staff Chair of the Water Utility Climate Alliance**, representing NYC among 12 major U.S. water utilities on climate resilience.
- Interested in how nature-based solutions can be used to protect communities and optimize infrastructure.

Kathleen Fallon, PhD

Marine District Coastal Processes & Hazards Specialist
New York Sea Grant

- Works with stakeholders to address coastal flooding and erosion challenges.
- Leads efforts to advance awareness and advise on the implementation of nature-based solutions.
- Contributed to a statewide monitoring framework and professional network.
- Reviews permitting processes and shoreline management policies.

Amy Motzny, MLA, ASLA

Director of Integrated Water Management
New York City Dept of Environmental Protection

- 15+ years in water resource management across public, private, and nonprofit sectors.
- Supports planning and engagement for Cloudburst and is project manager for Tibbetts Brook Daylighting project.
- Expert in urban green infrastructure strategies that deliver ecosystem services and socio-cultural benefits.
- Teaches sustainable planning and green infrastructure design at the Pratt Graduate Center.

John Truscinski, CFM

Director of Resilience Planning
Connecticut Institute for Resilience & Climate Adaptation

- Program Director for Resilient Connecticut, planning and technical assistance for municipal flooding and heat mitigation challenges.
- CIRCA priorities include: living shorelines design and monitoring, green infrastructure for stormwater quantity, urban tree canopy for heat risk reduction.
- Previously worked with New Jersey Chapter of TNC on living shorelines, beneficial use of dredged materials for marsh resilience.

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Nature-Based Solutions Panel Discussion

Do you consider this a NBS?

0

Yes No

Do you consider this a NBS?

0

Yes No

Do you consider this a NBS?

0

Yes No

Do you consider this a NBS?

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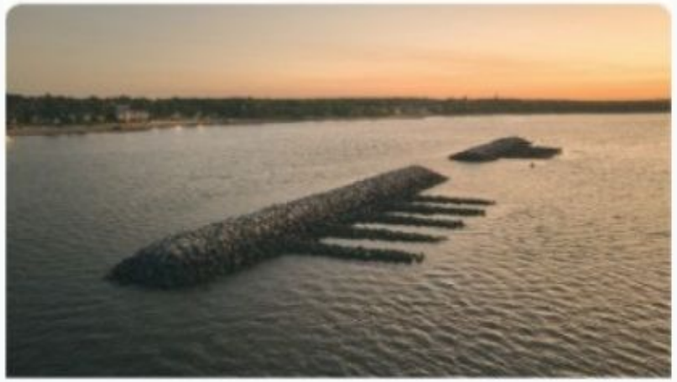

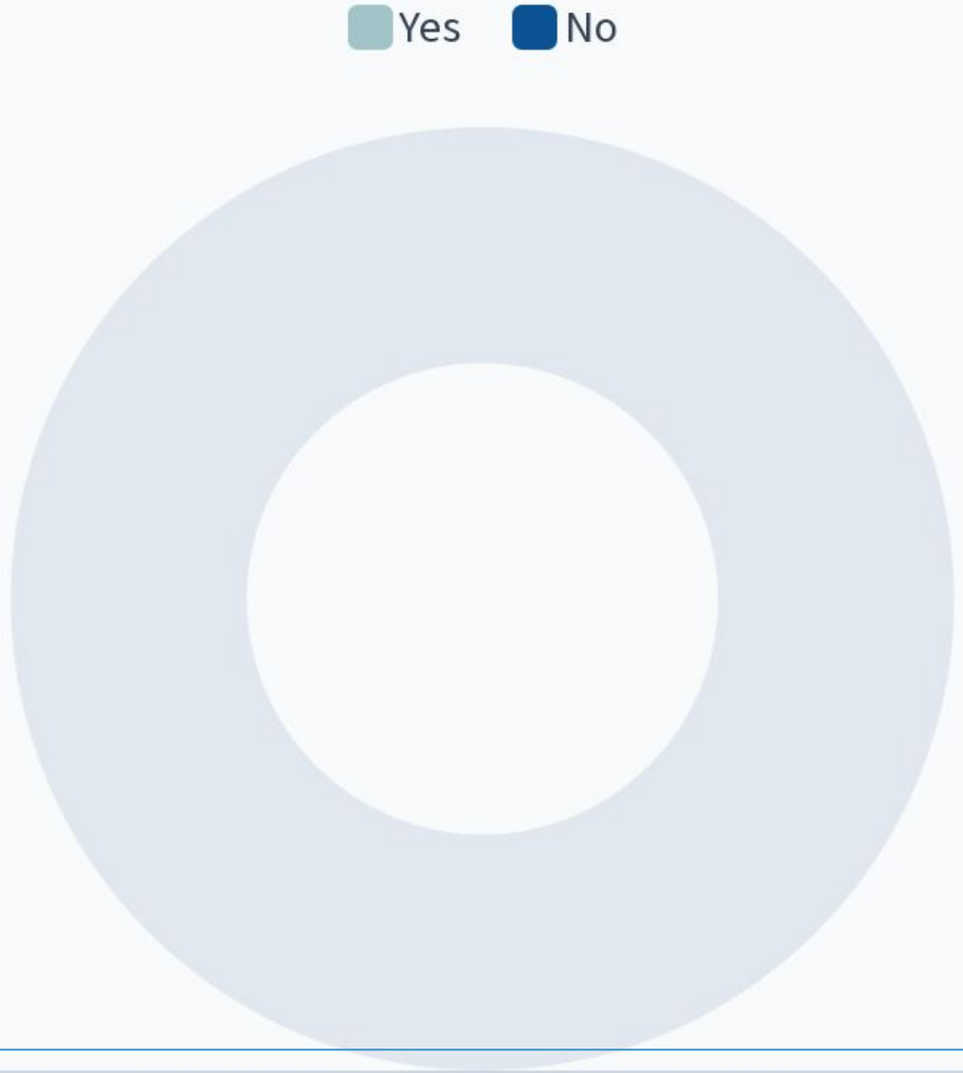

Do you consider this a NBS?

0

Yes No

Nature-Based Solutions Panel Discussion

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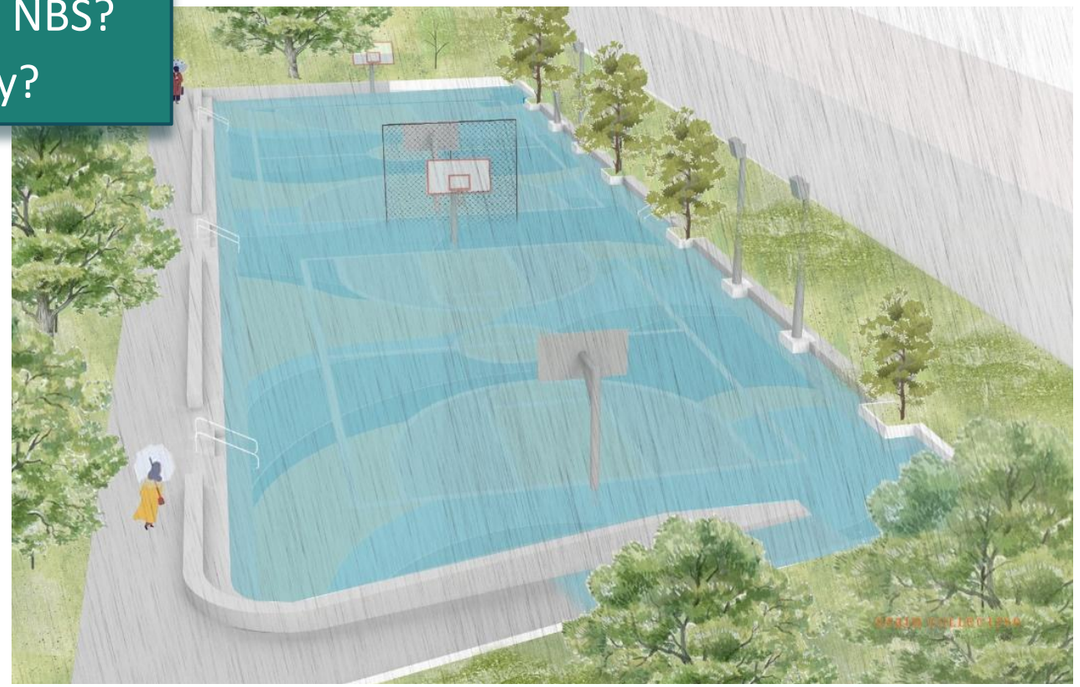
Panel Question 1

1

- Where do you draw the line with what is considered a nature-based solution or not?
- What are some important considerations for when to use green vs. gray infrastructure?

Question 1: What do you consider an NBS or not? When to use green vs. gray?

- ➔ What do you considered a NBS?
- ➔ When to use green vs. gray?



NYCHA South Jamaica Houses
Queens, New York

Campus-wide drainage plan with floodable open spaces and basketball court.

Nature-Based Solutions Panel Discussion

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Panel Question 2

2

- What is the most successful (or innovative) nature-based solution project you have been involved with?
- Why do you think it was successful?

Question 2: What's the **most** successful NBS you've worked on? Why?


Path to the Park, Valley Stream, NY


Green Roof at Aquatic Center, RCSP, Bronx, NY


Stormwater Wetland Pond, Carlls River/Sunrise Hwy, West Babylon, NY


Bioretention Swales at Nassau Community College, Garden City, NY

Question 2: What's the **most** successful NBS you've worked on? Why?

Path to the Park/Mill Brook Park, South Valley Stream, NY

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Path to the Park/Mill Brook Park, South Valley Stream, NY

Question 2: What's the **most** successful NBS you've worked on? Why?

Path to the Park/Mill Brook Park, South Valley Stream, NY

The success of the project can be attributed to several factors:

- **Design team commitment:** The entire team was dedicated to working with nature-based solutions (NBS) to the fullest extent feasible.
- **Diverse approaches:** A variety of NBS were employed rather than relying on a single strategy, including living shorelines, stream widening, floodable areas, coir logs, dense plantings, and bioretention swales.
- **Hybrid implementation:** NBS were combined with hardened infrastructure where necessary to ensure resilience and functionality.
- **Client engagement:** The client supported the use of NBS from the outset and was fully aware of—and committed to—the future maintenance requirements of these solutions.

Engineering Team: LKMA/NV5
Client: Town of Hempstead

Question 2: What's the **most** successful NBS you've worked on? Why?

Tibbetts Brook Daylighting

- Stream was covered and directed into a sewer in 1912
- Community has advocated for decades that Tibbetts be daylighted
- Project will improve water quality and improve drainage and **reduce combined sewer overflow (CSO) by 220M gal./year**
- For Tibbetts Brook, daylighting refers to diverting Tibbetts Brook away from the combined sewer system into its own to be constructed conduit. The new conduit will allow the brook to flow from a new weir to be constructed at Van Cortlandt Lake to the Harlem River.

NYC DEP, NYC Parks

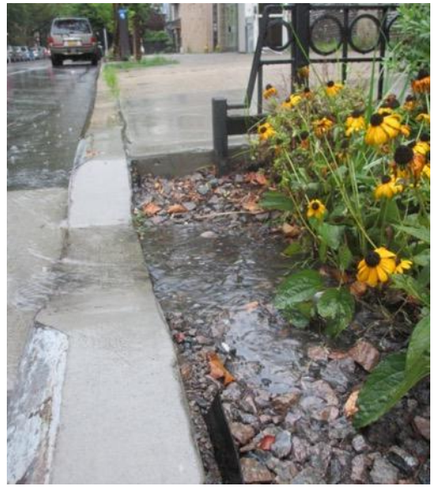
Question 2: What's the **most** successful NBS you've worked on? Why?

Evolution of NYC Green Infrastructure

Present

Green Infrastructure Program

2010

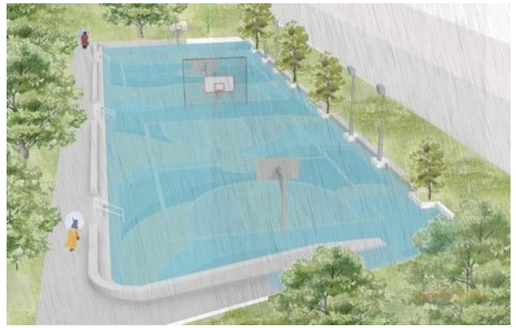


Copenhagen Partnership

2015

New York City Housing Authority Cloudburst Pilot Projects

2017

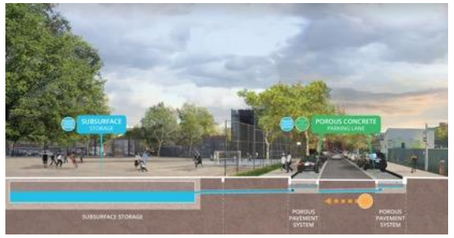


Tibbetts Brook Daylighting

2021

Cloudburst Hubs

2023



Nature-Based Solutions Panel Discussion

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Panel Question 3

3

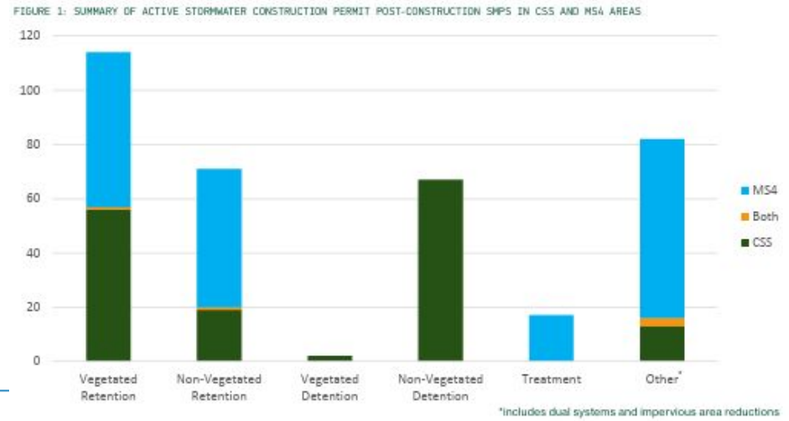
- Are there nature-based solution projects that you have worked on that haven't been successful?
- Why didn't they succeed?

Question 3: What's the **least** successful NBS you've worked on? Why?

Environmental Protection

Stormwater Regulations

- Unified Stormwater Rule was promulgated in 2022 to mandate stormwater requirements on public and private development sites
- Over 1,400 assets constructed managing ~130 acres of stormwater citywide
- A retention-first hierarchy that prioritizes green, vegetated SMPs – but some challenges



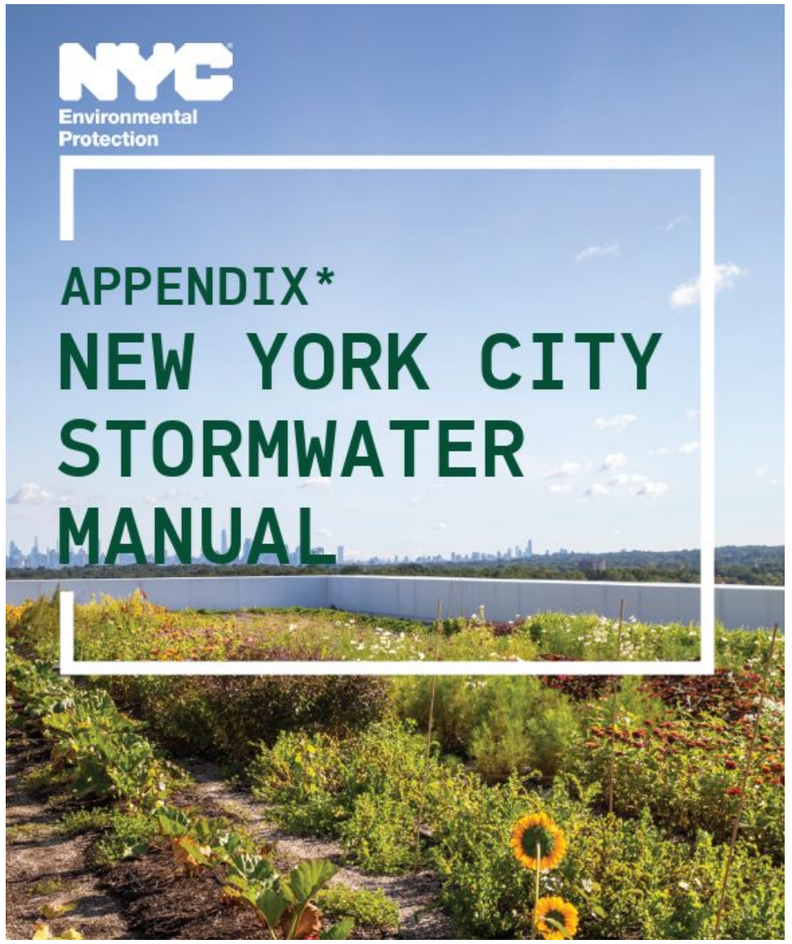
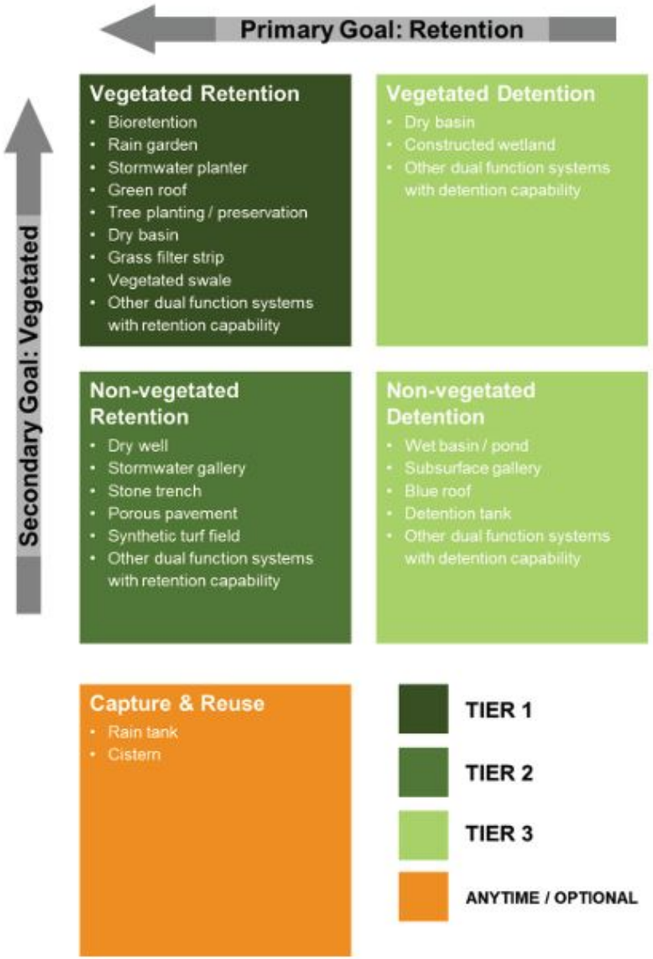


Figure 4.2. SMP hierarchy for CSS areas.



Question 3: What's the **least** successful NBS you've worked on? Why?

Importance of Broad Buy-In for NBS Projects

- **Successful implementation requires full commitment**
  - Especially for "new" techniques with unique usage and maintenance needs
- **Case Example: Main Street Raingarden (Long Island)**
  - Added as part of a streetscape + sustainability initiative
  - Supported by administration at the time, local interest group, and public
- **Post-Installation Challenges**
  - DPW unprepared for maintenance requirements
  - Parking District opposed loss of a parking stall
  - Newly elected administration did not support feature
  - Raingarden was removed and replaced with asphalt + parking
- **Key Takeaways**
  - Need broad support, across-departmental and across-political alignment
  - Importance of public + staff education on benefits & maintenance
  - Consensus-building is critical for durable NBS success

Raingarden on Main Street

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Panel Question 4

4

- → Do the barriers that the audience mentioned track with what you have experienced when working on nature-based solution projects?
- → How can we overcome these barriers?

Challenges to Implementing NNBF in NYS

While interest and implementation have grown, widespread adoption is limited due to **lack of knowledge about performance & best practices**

- **Project Typology:** can vary widely complicating performance comparisons
- **Project Monitoring:** can vary over a range of approaches and metrics
- **Data Accessibility:** is limited which inhibits knowledge sharing

Proposed Solutions

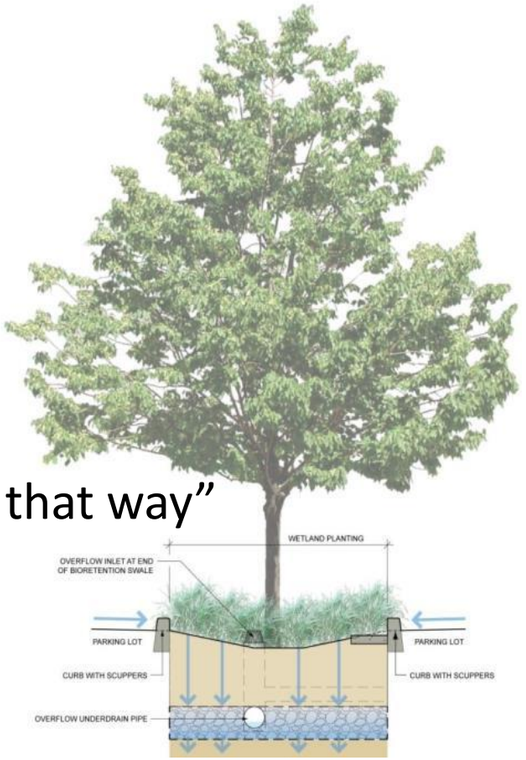
- **Community of Practice:** encourage sharing of successes, lessons learned
- **Standardized Data Collection:** encourage consistent monitoring; build a robust data set
- **Data Visualization:** inform decisions; increase education about NNBF
- **Comprehensive NNBF Database:** provide info about NNBF projects

Monitoring at CCE's Living Shoreline Demonstration Site. *NYSDOS*

Question 4: What barriers have you observed? How can we overcome them?

Main Barriers to Using NBS

- Institutional/organizational hurdles
- Policial cycles with shifting priorities
- New maintenance and operational practices
- Financial and budget misconceptions
- Lack of standardized guidelines
- Perception barriers – “we have always done it that way”
- Site and spatial constraints
- Requires multi-sector collaboration



Interpretive Sign Graphics by MPLA Studio

Potentially Successful Programs

- ✔ **Public outreach campaign** to communicate benefits, functionality, long term effects
- ✔ **Tax incentives** for installation of NBS, since they do save tax dollars in the long run
- ✔ **Grant program** targeted to support the planning & implementation of NBS
- ✔ Development of **better guidelines**, that local municipalities can follow

Nature-Based Solutions Panel Discussion

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Panel Question 5

5

- How can we work to identify more opportunities for nature-based solutions across Long Island Sound?
- How about in highly urbanized areas and on private property?

Question 5: How can we identify more opportunities for NBS in LIS?

Case Study: Maidstone Landing

Private community on LI's North Shore experiencing erosion and recession of their coastal bluff

- Original proposal: large rock revetment
- Currently: restoration through sand fencing and beach grass plantings

Opportunities

- environmentally-minded community
- forward thinking
- willing and supportive partners

Educational sign installed at Maidstone Landing's bluff restoration site. *NYSG*

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Audience Q & A

Panel Question 6

6

→ How can we better monitor and track the success of nature-based solution projects?

Nature-Based Solutions Panel Discussion

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Panel Question 7

7

→ What are some tools, resources, or starting points that you would recommend to those who are working on resilience projects and would like to try and incorporate nature-based solutions?

Nature-Based Solutions Panel Discussion

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Panel Question 8

8

- For those whose communities have implemented nature-based solutions, can you speak to your experience with maintenance?
- How well (or not) are these projects being accepted by the community?
- Have community groups been involved in(or expressed interest in) assisting with the maintenance?

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Thank you!

Please share feedback on today's session:

https://s.zoom.us/m/bPlTS2eN5

Session 3 – LIS Resilience Planning Support Program: New Round Available & Showcase of Completed Projects

Tomorrow!

Friday, December 5, 10-11:30 AM