

**Attendee Summary - Workshop #1:**  
**Identifying Knowledge Gaps and Data Needs in NNBF**  
**U.S. Coastal Research Program**  
**+**  
**NNBF Data Synthesis Framework:**  
**Understanding Natural and Nature-Based Features in New York**  
**State.**

Stakeholder Workshop at The Graduate Center for Worker Education  
6/28/2023

Thank you for attending and participating in the USCRP Workshop #1. Your involvement in this first meeting was invaluable and has assisted us in pursuing the next steps for our future workshops, and working towards our goal of expanding our knowledge of NNBF and end-user needs. Below you will find notes summarizing the discussions had by each group (Practitioners, Researchers, and Policy-Makers). If you feel we are missing anything of pertinence, even if it was not stated during the workshop, and would like us to amend these notes, feel free to let us know at: [ghumphries@gc.cuny.edu](mailto:ghumphries@gc.cuny.edu)

Attendees, both virtual and in-person, belonged to the following organizations. We hope to expand to more groups in the near future.

Science + Resilience Institute at Jamaica Bay	<a href="http://Srijb.org">Srijb.org</a>
New York Sea Grant	<a href="https://seagrantsunysb.edu/">https://seagrantsunysb.edu/</a>
New York Department of State	<a href="https://dos.ny.gov/">https://dos.ny.gov/</a>
Save the Sound	<a href="https://www.savethesound.org/">https://www.savethesound.org/</a>
New York City Government	<a href="https://www.nyc.gov/">https://www.nyc.gov/</a>
New York City – Mayor’s Office of Climate & Environmental Justice	<a href="https://climate.cityofnewyork.us/topic/environmental-justice/">https://climate.cityofnewyork.us/topic/environmental-justice/</a>
New York City Department of Parks & Recreation	<a href="https://www.nycgovparks.org/">https://www.nycgovparks.org/</a>
New York City Department of Environmental Protection	<a href="https://www.nyc.gov/site/dep/index.page">https://www.nyc.gov/site/dep/index.page</a>
New York City Department of Environmental Conservation	<a href="https://www.dec.ny.gov/">https://www.dec.ny.gov/</a>
New York City Economic Development Corporation	<a href="https://edc.nyc/">https://edc.nyc/</a>
KOL/MAL LLC	<a href="http://www.kolmal.com/">http://www.kolmal.com/</a>
Hudson River Foundation	<a href="https://www.hudsonriver.org/">https://www.hudsonriver.org/</a>
AKRF, Inc.	<a href="https://www.akrf.com/">https://www.akrf.com/</a>
Arcadis	<a href="https://www.arcadis.com/">https://www.arcadis.com/</a>
The Waterfront Alliance	<a href="https://waterfrontalliance.org/">https://waterfrontalliance.org/</a>
Scape Studio	<a href="https://www.scapestudio.com/">https://www.scapestudio.com/</a>
Gateway National Recreation	<a href="https://www.nps.gov/gate/index.htm">https://www.nps.gov/gate/index.htm</a>
First Coastal	<a href="https://firstcoastal.com/">https://firstcoastal.com/</a>
University of Georgia – IRIS	<a href="https://iris.uga.edu/">https://iris.uga.edu/</a>
East Hampton Government	<a href="https://www.ehamptonny.gov/">https://www.ehamptonny.gov/</a>
Rippled Waters LLC	<a href="https://www.rippledwatersllc.com/">https://www.rippledwatersllc.com/</a>
WSP	<a href="https://www.wsp.com/en-us">https://www.wsp.com/en-us</a>
New York-New Jersey Harbor and Estuary Program	<a href="https://www.hudsonriver.org/estuary-program">https://www.hudsonriver.org/estuary-program</a>
Peconic Estuary Partnership	<a href="https://www.peconicestuary.org/">https://www.peconicestuary.org/</a>

## Workshop #1 Objectives & Purpose

### Workshop Objectives:

NNBF is becoming a prominent alternative to shoreline armoring. However, there are gaps in our knowledge regarding NNBF, particularly in terms of its suitability and performance in different environments. Collectively, we need to continue to identify critical needs for advancing the use of NNBF in building socially, ecologically, and structurally resilient shoreline practices in NYC and New York State. Building off of our pre-existing work and integrating USCRP-funded research, the goal of this project is to coproduce forums, workshops, data visualization, and communications products that connect diverse end-users with relevant expertise about NNBF.

This workshop was the first in a series aimed to address knowledge gaps in shoreline management, specifically in regards to natural and nature based features (NNBF), through applied research and management. The stakeholder needs identified during this workshop will inform the focus and format of future gatherings and knowledge sharing.

### Outputs of Workshop #1:

- Creation of profiles of NNBF knowledge end-users for each group.
  - (1) Practitioners (Engineering, Planning, Design, and/or Construction); (2) Research and Assessment; and (3) Policy-Makers, Regulators, and Permittees.
- Creation of a needs assessment (list of gaps in knowledge) for each user profile group
- A list of existing/in progress NNBF projects.
- Clear Impact Statements from each end-user group on how they would use synthesized data from the NYS Shoreline Monitoring Framework.
- Prioritized comparison/basis of comparison using monitoring data.

### Invitees:

Invitees were chosen based on current NNBF expertise and experience, consisting of practitioners, policy-makers/permittees, researchers, and community-based educators and communicators. All invitees are considered end-users/stakeholders of NNBF, who would benefit from enhanced knowledge of these features and have direct insight into knowledge gaps in their field.

*\* Unfortunately, communicators/educators were underrepresented in Workshop #1, and will be added to future guest lists for better participation.*

To suggest individuals who you believe should be invited to future workshops, please email: [ghumphries@gc.cuny.edu](mailto:ghumphries@gc.cuny.edu)

## Activity #1 – Part 1: Identifying Knowledge Gaps

*\* Communicators/educators who primarily identified as such were underrepresented during this workshop, and were added to secondary choice groups aligned most closely with their work.*

**Discussion 1** - What types of decisions does your organization make related to the implementation of Natural and Nature-Based Features (NNBF) in New York State (NYS)? (i.e., what is your role in the creation and/or maintenance of NNBF projects?)

**Policy-Makers, Regulators & Permitters:** Users belonging to this group cited making decisions relating to: how coastal zones are utilized, providing research, technical assistance, and guidance to various agencies, partners, and non-governmental organizations (NGOs). Moreover, they are tasked with making decisions related to permitting projects, taking into account the likelihood of success for NNBF and considering the environmental factors of the area.

**Practitioners (Engineering, Planning, Design, Construction):** Users belonging to this group cited making decisions relating to: wetland restoration design, proposing and engineering alternatives to hard infrastructure, consulting to improve designs, performing managerial roles, assessment of NNBF feasibility and long-term structural ability, as well as providing information and consultation for land-owners.

**Research & Assessment:** Users belonging to this group cited making decisions relating to: leading NNBF monitoring programs, testing protocols and methods as well as making them accessible, tracking NNBF progress, experimentation with NNBF techniques and redesigns, researching effectiveness, development of future projects, and providing data for policy-makers and locals.

**Discussion 2** - Have you or your organization ever used research/monitoring data to make a decision related to NNBF? If yes, how did you access it and how did it inform the decision? What roadblocks did you run into regarding access?

### Policy:

- Much of the data used cited by this group pertained to access of publicly accessible online databases such as those released by the National Oceanic and Atmospheric Administration (NOAA). This includes monitoring data used to inform projects.
- Reasons for lack of data access cited by this group included:
  - o Finding only limited info on NNBF success;
  - o Lack of long-term data;
  - o Limited data pertaining to social benefits;
  - o Old data that has not been updated;
  - o Paywalls (system that prevents users from accessing journal content without a paid subscription) and non-publicly accessible data;
  - o And, limited data by location (such as those on Long Island Sound).

### Practitioners:

- Much of the data used by this group pertained to sea level rise (SLR). Specifically, trying to procure site-specific SLR data, and translating it into use. As data is showing that accretion is not keeping up with SLR. This is important for sustainable design...
- Some of the roadblocks to data access cited by this group included:
  - o Finding agreed upon data for accretion and/or wave behavior is difficult;
  - o Much of data access is based on who you can call and ask;
  - o Monitoring and post-construction data often remains within engineering groups and agencies rather than being released;
  - o Challenges with interpretation;
  - o Requirements for funding;
  - o And journal subscriptions are pricey.

### **Research:**

- Much of the data used by this group pertained to SLR, to design NNBF ahead of future rise. Some of that data includes geospatial data and LIDAR (Light Detection and Ranging).
- Some of the roadblocks to data access cited by this group included:
  - o SLR data not coming in fast enough to adjust for higher elevation in design;
  - o Figuring out the correct sea level rise (SLR) data to utilize;
  - o Limited data on hydrology, hydro-dynamics, and incorporated elevation;
  - o Low spatial resolution in data;
  - o Difficulty finding synthesized topographic and bathymetric data;
  - o And a lack of fine-scale data for long-term monitoring and modeling.

**Discussion 3** - Creating a list. What have been the primary knowledge gaps for your organization relating to NNBF? More specifically, what are knowledge gaps related to (1) socio-economic benefits (2) ecological function (3) structural integrity. In other words, what is the science/data that people feel they are lacking?

AND

**Discussion 4** - From your list (Discussion 3), what are the top 3 most important knowledge gaps you identified? *Note: The most important gaps the groups voted as their top 3 are in bold below.*

### **Policy:**

- **Success rates of existing NNBF (were project goals met?)**
- Data on site suitability
- Data on impacts of extreme weather events such as hurricanes, as well as compounding factors such as SLR, and impacts of flooding.
- Evaluations of success in ecological community and function (i.e., did the NNBF support biodiversity?)
- Comprehension of habitat tradeoffs in NNBF implementation
- Benthic ecology
- Socioeconomic benefits (recreational, mental health, public health, aesthetic, etc.)
- Lack of publicly accessible data
- Risk reduction benefits

- Community needs (education, project interest, etc.)
- Carbon sequestration of NNBF
- **Costs of NNBF, including fund availability and incentives**
- Durability of NNBF materials (such as erosion of low elevation NNBF)
- Baseline information on site-specific endangered and threatened species
- Data limitations by location
- Data limitations by lack of updated sources
- **Data on baseline site conditions (ecological and physical)**

### Practitioners:

- Predictability gap with regulatory bodies - Regulations don't provide review mechanisms
- Policy interpretation (i.e., what are long-term effects? Can NNBF be sustained?)
- Biological performance (nature-based vs. nurture, benefit or performance)
- **Outdated baselines (baseline conditions for sites)**
- The expectation for nature-based solutions to be self-sustaining (is this possible?)
- Community pushback
- Performance and longevity on NNBF
- Funding difficult to procure for consultants
- Gaps in data for accretion and SLR (including understanding sediment accretion in regard to SLR)
- Mismatched opinions on sediment accretion or wave behavior data
- Internal knowledge sharing (leaving others out of the conversation)
- Inaccessible/non-public and/or pricey reports and monitoring data
- Mismatched interpretations of data between groups
- **Data on post-construction performance (including data on successes and failures; i.e., success rates)**

### Research:

- Data is released slower than sea level rise occurs
- Data gaps in hydrology, sediment budget, and hydrodynamics
- Low spatial resolution in data (Some are using LIDAR to correct for this)
- Data gaps in topographic and bathymetric data
- Socio/cultural benefits of NNBF beach vs promenade
- **Social, cultural, and environmental benefits of NNBF that are separated by locality. (Data should be integrated, place-based, and consistent in scale)**
- Disconnection in the different research disciplines- a cultural issue with NNBF research
- Collaboration is not often place-based
- Issues procuring long-term data (particularly on techniques)
- **Overall need for higher quality datasets with high resolution**
- How to course-correct projects that are insufficient
- How to design and implement adaptive management
- **Long term data on success of different NNBF techniques and how to course correct if something goes wrong**

## Activity #1 – Part 2: Voting for Top 3 Knowledge Gaps

All individuals voted for the top 3 knowledge gaps they believed were most pertinent for the future of NNBF as a whole, not just for their specific user group. The top 3 are listed below:

1. **Success Rates of NNBF:** looking at if goals/project objectives were met per site (measurable co-benefits, ecological success, adaptive management etc.)
2. **Baseline conditions of sites:** ecological, physical, community needs, etc.
3. **Socio-cultural benefits of NNBF:** integrated and place-based (Aesthetics and community response and acceptance)

## **Activity #2 – Crafting an Impact Statement and Identifying Preferred Basis of Analysis/Comparison for the “Measuring Success” Project**

Participants engaged in a two-step process:

1. First, stakeholders were asked to develop individual impact statements to articulate the long-term impacts they each wished to see through the use of the synthesis framework of existing data on NNBF from “Measuring Success.”

Following this, stakeholders joined their respective user-profile group to identify commonalities in their visions and desired outcomes from NNBF assessments as expressed in their impact statements. The objective was to collaboratively craft a final impact statement that represents a collective vision of the achievements that could be realized through the use of the synthesis framework.

2. Secondly, stakeholders were asked to reflect on and prioritize the level of comparison/analysis most vital for effectively assessing NNBF project success and aligning with the impact statement's vision.

### **Results**

*\*Notes on analysis of final outputs from activity #2:* Upon reviewing the final impact statements, slight revisions were made to enhance their relevance and usefulness for the framework research and development process. The adjustments were focused on identifying key words that indicate articulation of long-term visions and outcomes. These revisions ensured that the original statements remained intact while becoming more accessible, easy to navigate, and action oriented, facilitating clear communication and further development. The revised statements are structured based on the following order:

<b>To</b>	<b>1) Desired effect (action verb)</b>	<b>2) The thing being changed, expected results</b>	<b>3) For Whom, where, when (key end users, beneficiaries)</b>	<b>4) The How, the Intervention</b>
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### **Policy:**

#### **Final Impact Statement:**

Group: Evaluate the data to increase its utility and accessibility for decision-makers by improving knowledge and confidence in the efficacy of NNBF to inform implementation and policy.

Researcher revision: To enhance knowledge and confidence in the effectiveness of NNBF interventions to inform evidence-based decision-making, implementation, and policy development through increased utility and accessibility of data.

**Preferred Basis of Analysis/Comparison:**

1. NNBF vs. Hard Structures/Shorelines

**Practitioners:**

**Final Impact Statement:**

*\*Note: In the practitioner group, no new impact statements were generated. Instead, people showed a general agreement with the example impact statements provided in the workshop booklet. As a result, both impact statements are included, and the researcher's vision represents a combination and reconciliation of these statements.*

Group: To effectively assess and select appropriate NNBF techniques for enhancing ecological resiliency and economic viability through context-based comparison of different NNBF techniques

Group: To prove enhanced/superior performance of NNBF techniques and strategies relative to hard structures in providing resilience services in shoreline management through standardizing data for comparative assessment.

Researcher revision: To effectively assess and select appropriate NNBF techniques, especially as an alternative to traditional hard structures, for providing resilience services through standardized data and context-based comparative assessment.

**Preferred Basis of Analysis/Comparison:**

1. Single site comparison relative to performance goals

**Research:**

**Final Impact Statement:**

Group: To enhance the science and data basis for assessing and selecting appropriate NNBF techniques for local ecological, social, and physical conditions/contexts

Researcher revision: To effectively assess and select appropriate NNBF techniques based on local ecological, social, and physical conditions and contexts through enhanced science and data basis.

**Preferred Basis of Analysis/Comparison:**

1. NNBF vs. itself over time
2. Technique vs (similar) techniques in different contexts across time. (technique validation)

**Next Steps:**



1. Final outputs are being reviewed to establish criteria and parameters for an ongoing literature review to identify candidate methodologies for synthesizing interdisciplinary data on NNBF.
2. Filter and select candidate methodologies and approaches aligning with the impact statements' desired visions.
3. Develop a more complete version of the synthesis framework based on the selected methodologies.
4. Present a draft of the synthesis framework to stakeholders for feedback and suggestions.

### **Call to Action**

We invite all stakeholders to review the final outputs from the workshop and provide us with any additional feedback, inputs, and suggestions. We would appreciate it if workshop participants can assess if the revisions accurately capture your expressed visions through the impact statements exercise.

For those who could not attend the workshop, we encourage you to reach out and share your insights as your comments are equally valuable.

Please feel free to reach out via email or by phone. We are happy to set up meetings via Zoom to discuss this project further with stakeholders. You can reach us at:

[Georgie Efegenia Humphries: ghumphries@gc.cuny.edu](mailto:ghumphries@gc.cuny.edu) | (347) 256-8329

### **Appendix | Supplementary Material (Pages 10 - 12)**

End-user profiles developed based on discussions from each group. Meant to act as a brief summary of each end-user group's major points and participants. Much of the language here is repeated in the Workshop #1 Stakeholder Summary above.

# User Group:

## Policy-Makers, Regulators, and Permitters

**Policy-Makers, Regulators, and Permitters** are the group of NNBF end-users that make decisions pertaining to implementation, policy-creation, funding, and permitting of NNBF projects. Specifically, users belonging to this group have cited making decisions relating to: how coastal zones are utilized, providing funding for research and technical assistance, as well as supporting agencies, partners and NGOs by providing guidance and management. Permitters cite responsibilities in permitting projects based on likelihood of NNBF success and environmental factors of an area.

Some of the organizations that self-identified as being part of this end-user group are New York Department of State (NYDOS), New York City Mayor's Office of Climate and Environmental Justice, New York Parks Department, New York Department of Environmental Protection (NYDEP), New York Department of Environmental Conservation (NYDEC), New York-New Jersey Harbor and Estuary Program, and East Hampton Government.

### Knowledge Gaps & Roadblocks to Access

- **Success rates of existing NNBF (were project goals met?)**
- Data on site suitability
- Data on impacts of extreme weather events (flooding, SLR, hurricanes, etc.)
- Evaluations of success in ecological community and function (did the NNBF support biodiversity?)
- Comprehension of habitat tradeoffs in NNBF implementation
- Benthic ecology
- Socioeconomic benefits (recreational, mental health, public health, aesthetic)
- Lack of publicly accessible data
- Risk reduction benefits
- Community needs (education, project interest, etc.)
- Carbon sequestration of NNBF
- **Costs of NNBF, including fund availability and incentives**
- Durability of NNBF materials (such as erosion of low elevation NNBF)
- Baseline information on site-specific endangered and threatened species
- Data limitations by location
- Data limitations by lack of updated sources
- **Data on baseline site conditions (ecological and physical)**

*\* Knowledge gaps in **bold** were voted the top 3 most pertinent to address*

### 3 Most Pertinent Knowledge Gaps for Policy Makers, Regulators and Permitters

- **Success rates of existing NNBF**
  - Specifically pertaining to if the goals and objectives of a project were met. In addition to if there was success in the ecological communities as a whole, not just plants (i.e., did it support biodiversity, are there measurable co-benefits? etc.)
- **Costs of NNBF, including fund availability and incentives**
  - What is the availability of funds for NNBF projects, how much did they each cost, and are there any funds for possible incentives?
- **Data on baseline site conditions**
  - When choosing a site to implement NNBF, what is the baseline condition? I.e., the physical and ecological condition, as well as the community-oriented needs of the location.

**Practitioners (Engineering, Planning, Design, Construction)** are the group of NNBF end-users that make decisions pertaining to design of NNBF, infrastructure proposals, building, and consultation for NNBF projects. Specifically, users belonging to this group have cited making decisions relating to: wetland restoration design, proposing and engineering alternatives to hard infrastructure, consulting to improve designs, performing managerial roles, assessing of NNBF feasibility and long-term structural ability, as well as providing information and consultation for land-owners.

Some of the organizations that self-identified as being part of this end-user group are First Coastal (environmental consulting), New York Department of Environmental Conservation (NYDEC), Rippled Waters LLC (engineering), WSP (engineering), New York City Parks Department, Hudson River Foundation, AKRF (engineering), Arcadis (engineering/consultation), New York City Economic Development Corporation, KOL/MAC LLC (architecture), and Scape Studio (architecture).

### Knowledge Gaps & Roadblocks to Access

- Predictability gap with regulatory bodies - Regulations don't provide review mechanisms
- Policy interpretation (i.e., what are long-term effects? Can NNBF be sustained?)
- Biological performance (nature-based vs. nurture, benefit or performance)
- **Outdated baselines (baseline conditions for sites)**
- The expectation for nature-based solutions to be self-sustaining (is this possible?)
- Community pushback
- Performance and longevity on NNBF
- Funding difficult to procure for consultants
- Gaps in data for accretion and SLR (including understanding sediment accretion in regard to SLR)
- Mismatched opinions on sediment accretion or wave behavior data
- Internal knowledge sharing (leaving others out of the conversation)
- Inaccessible/non-public and/or pricey reports and monitoring data
- Mismatched interpretations of data between groups
- **Data on post-construction performance (including data on successes and failures; i.e., success rates)**

\* Knowledge gaps in **bold** were voted by all groups as the top 1/3 most pertinent to address

### 2 Most Pertinent Knowledge Gaps for Practitioners

- **Outdated baselines (baseline conditions for sites)**
  - When choosing a site to implement NNBF, what is the baseline condition? I.e., the physical and ecological condition, as well as the community-oriented needs of the location.
- **Data on post-construction performance**
  - Reports on the success rates of NNBF construction. This would include successes, failures, biological performance, etc.

# User Group: Research and Assessment

**Researchers and individuals who perform NNBF assessment** are the group of NNBF end-users that make decisions pertaining to the monitoring, implementation, and data gathering of NNBF past, present, and future projects. Specifically, users belonging to this group have cited making decisions relating to: leading NNBF monitoring programs, testing protocols and methods as well as making them accessible, tracking NNBF progress, experimentation with NNBF techniques and redesigns, researching effectiveness, development of future projects, and providing data for policy-makers and locals.

Some of the organizations that self-identified as being part of this end-user group are New York Department of State (NYDOS), Save the Sound, New York City Parks Department, Hudson River Foundation, AKRF (engineering), Peconic Estuary Partnership, KOL/MAC LLC (architecture), and the UGA - Institute for Resilient Infrastructure Systems.

## Knowledge Gaps & Roadblocks to Access

- Data is released slower than sea level rise occurs
- Data gaps in hydrology, sediment budget, and hydrodynamics
- Low spatial resolution in data (Some are using LIDAR to correct for this)
- Data gaps in topographic and bathymetric data
- Socio/cultural benefits of NNBF beach vs promenade
- **Social, cultural, and environmental benefits of NNBF that are separated by locality. (Data should be integrated, place-based, and consistent in scale)**
- Disconnection in the different research disciplines- a cultural issue with NNBF research
- Collaboration is not often place-based
- Issues procuring long-term data (particularly on techniques)
- **Overall need for higher quality datasets with high resolution**
- How to course-correct projects that are insufficient
- How to design and implement adaptive management
- **Long term data on success of different NNBF techniques and how to course correct if something goes wrong**

*\* Knowledge gaps in **bold** were voted the top 3 most pertinent to address*

### 3 Most Pertinent Knowledge Gaps for Researchers

- **Social, Cultural, and Environmental Benefits**
  - Looking at the site-specific benefits of NNBF pertaining to both the human/community aspect, as well as the environmental benefits. I.e., looking at place-based data to measure success.
- **Higher Quality Datasets**
  - Specifically, higher resolution with consistent scale, and more in-depth and organized datasets.
- **Success rates of existing NNBF**
  - Specifically pertaining to if the goals and objectives of a project were met. If there were any successes, failures (and therefore, how to course correct).