Measuring Success

Monitoring Natural and Nature-Based Shoreline Features (NNBF) in New York State

Webinar: Jan. 17 2020
I. Ground Rules (Facilitator: Bennett Brooks, Consensus Building Institute)

II. Welcome and Introductions (Dr. Brett Branco, Science and Resilience Institute at Jamaica Bay (SRIJB); Carolyn Fraioli, NYDOS; Amanda Stevens, NYSERDA)

III. Monitoring Framework Background (Pippa Brashear, SCAPE)

IV. Process and Feedback (Helen Cheng, NY Sea Grant / SRIJB)

V. Selecting Parameters, Indicators and Protocols (Dr. Peter Groffman, Brooklyn College)

VI. Pilot Data Collection (Chris Haight, NYC Parks)

VII. Discussion (Bennett Brooks, CBI)

VIII. Next Steps and Concluding Thoughts (NYSERDA, NYDOS, SRIJB)
Monitoring Framework

Background

Pippa Brasheer, SCAPE
Why do we need a monitoring Framework?

- Despite a growing number of pilot projects, widespread adoption of NNBFs remains limited.
- This is in part due to a lack of data on how such shorelines perform relative to goals such as providing risk reduction benefits, ecosystem services, socio-economic benefits or other services that decision-makers are interested in.
- There is no state-wide system to evaluate the relative performance of different shoreline features.
- As a result, there is currently limited data available on their actual (versus modeled) performance, and any existing data is difficult to compare because it has not been collected through consistent protocols.
- So how do we decide what type of shoreline is best for our goals? Or how we should design or manage our shorelines?
Project Goal & Objectives

Develop a coherent framework for shoreline monitoring that will guide data collection to inform more consistent and effective shoreline management decisions in New York State, particularly as it relates to NNBF.

- Identify key performance and resiliency benefits of NNBF through a stakeholder-driven process.
- Develop standardized protocols to generate better comparative data across the diverse shorelines of New York State.
- Help decision makers determine which benefits are realized at shoreline sites.
What are we monitoring? (shoreline types)
Who are we monitoring for?

Shoreline managers across NYS
…who can be property owners, property managers, engineers, contractors and agencies … they are individuals or organizations who make decisions about how we plan, build, and maintain our shorelines.

Shoreline managers need comparative data collected through consistent protocols. So, the framework will first be used by…

Partners collecting data…
…who may be scientists, stewardship groups, citizens, or shoreline managers themselves.
What is a monitoring framework? (parameters & indicators)
## Evaluation Roadmap

<table>
<thead>
<tr>
<th>Resilience Service Area</th>
<th>Performance Parameter</th>
<th>Indicators</th>
<th>Associated Protocols</th>
<th>field protocols</th>
<th>desktop protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ecological Function</strong></td>
<td>Biological Health &amp; Biodiversity</td>
<td>Plant species cover, abundance, species richness and composition (including native versus exotic)</td>
<td>Seaside organisms presence, abundance, (percent) cover, species richness, and composition</td>
<td>Establishing Sampling Scheme (including transect locations, etc.)</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Habitat Connectivity</td>
<td>Distribution and abundance of substrates including wrack, debris, concrete, etc.</td>
<td></td>
<td></td>
<td>n/a</td>
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<td>Hydrology</td>
<td>Habitat connectivity to adjacent areas, habitats, land uses in all directions</td>
<td>Site and feature characterization (Site Questionnaire)</td>
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</tr>
<tr>
<td><strong>Hazard Mitigation and Structural Integrity</strong></td>
<td>Shoreline and topographic change</td>
<td>Change in Feature Position and Elevation</td>
<td>Feature Elevation - Field</td>
<td>Feature Elevation - Field</td>
<td>Feature Elevation - Field</td>
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<tr>
<td></td>
<td></td>
<td>Change in Shoreline Position (size and/or Uplift / Downshift)</td>
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<tr>
<td></td>
<td>Coastal Flooding</td>
<td>Change in Wave Conditions</td>
<td>Water Levels and Coastal Flooding Data - Simplified</td>
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<td>Water Levels</td>
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<td></td>
<td>Structural Integrity</td>
<td>Change in Feature Position and Elevation</td>
<td>Feature Elevation - Field</td>
<td>Erosion Measurements and Asset Displacement</td>
<td>Establishing Sampling Scheme (including transect locations, etc.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Visible Scour, Erosion, Escarpments, and/or Material Degradation</td>
<td>Erosion Measurements and Asset Displacement</td>
<td>Establishing Sampling Scheme (including transect locations, etc.)</td>
<td>Site photolog (to be developed in future)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change in Vegetation, Shelf, or Other Biomass of Structure</td>
<td>See biological health and biodiversity protocols</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Quality of Life</strong></td>
<td></td>
<td>Household Perception of Risk, Neighborhood Satisfaction (general) &amp; as it relates to shoreline condition, and Quality of Life</td>
<td>Household Survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Socio-Economic Indicators</strong></td>
<td>Recreation and Cultural Use</td>
<td>Observation and Telling of Recreation and Cultural Shoreline Use</td>
<td>Shoreline Social and Site Assessment Protocol</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Economic Development</td>
<td>Change in Real Estate Value</td>
<td>n/a</td>
<td>Real Estate Value Impacts</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Business Activity Index</td>
<td>Business Activity Impacts</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Property Damage &amp; Cost of Recovery</td>
<td>Real Estate Value Impacts</td>
<td>Household Survey</td>
<td>Environmental Justice Index</td>
</tr>
<tr>
<td></td>
<td>Environmental Justice</td>
<td>Presence/Absence of Potential Environmental Justice Area</td>
<td>n/a</td>
<td></td>
<td>Environmental Justice Index</td>
</tr>
<tr>
<td></td>
<td>Civic Engagement</td>
<td>Rate of participation in stewardship related to shoreline</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Monitoring Protocols

Measuring Success: Monitoring Natural and Nature Based Features in NYS

Annotated Protocols and Worksheets for Data Collection

January, 2020

Worksheet 5A: Segment Descriptions

<table>
<thead>
<tr>
<th>Site Name:</th>
<th>Surveryor(s):</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feature Name:</td>
<td>Date:</td>
</tr>
</tbody>
</table>

Protocol 5: Establishing a Monitoring Scheme

SUMMARY INFORMATION

Related resilience service categories: Ecological Function and Hazard Mitigation/Structural Integrity

Associated Indicators: Plant species cover, abundance, species richness and composition (including native versus exotic), Describes vegetation presence, abundance, (percent) cover, species richness, and composition. Definition and abundance of substrates including rock, debris, concrete, etc. Change in structure, position and elevation, Change in shoreline Position

Preparation time: 1-2 hours

Protocol type: Spotted, medium, handheld

Protocol setup:

Number of people required: 1-2

Approximate time to complete: 1-2 hours

Equipment required: P/N: Y (see below for specific)

OVERVIEW OF PROTOCOL

This protocol establishes the sampling scheme layout, including transect locations and “assessment points” for all habitat types and health indicators measured. (Structure) or the objective of monitoring this protocol must be completed in the form of any of the other Ecological Function (111) & Hazard Mitigation 8 Structural Integrity (HMSI) protocols or monitoring locations are used in the transect and assessment points set up by this protocol.

FREQUENCY

This protocol only needs to be undertaken once (the first time monitoring is performed at the site). If this assumption is not valid, any effort at a given site, and the sampling scheme set up from the initial monitoring should be used for subsequent monitoring. The assumptions are that the absence of significant alteration of movement in the site or shoreline feature.

REQUIREMENTS (EQUIPMENT, TRAINING, ETC.)

Prerequisite protocols:

- Protocol 1: Site and Feature Characterization
- Protocol 2: Feature Definition, Location, and Spatial Dimension
- Protocol 3: Feature Area/Dimension

If the above protocols are not completed prior to site use, the monitoring protocols are described in the relevant part of the protocol.

EXAMPLE

Worksheet 5A: Segment Descriptions

1. Units of measurement:
   a. Horizontal datum units:
   b. Vertical datum units: NAD 88, feet, unless otherwise indicated.

2. Shoreline length:
   a. Total length of shoreline feature in ___________ feet [measured in a straight line, beginning point to endpoint]
   b. If shoreline feature consists of multiple "types", length of feature by "type" in feet:

3. Segments:
   a. Number of different segments:
   b. Length of each segment:
   c. Observation:

4. Transects:
   a. Total number of transects:
   b. Number of transect lines per each segment in the table:

5. Sketch or annotated aerial photo

[Attachment]

* See Worksheet 1C
PROJECT OUTPUTS
(PROJECT DELIVERABLES)

- GOALS/INDICATORS & METRICS
- PROTOCOLS
- PILOT PROJECT DATA (to inform refinement of protocols)
- COMMUNITY NETWORK (informed, engaged, connected stakeholders)
- DATABASE (pilot project data storage)

NEAR-TERM OUTCOMES

- COLLECTION OF RELEVANT LONG-TERM DATA SETS
- NETWORK OF MONITORING PARTNERS
- COHERENT & COMPARABLE EVALUATION OF SHORELINE MEASURES

LONG-TERM OUTCOMES

- BUY-IN FROM AGENCIES/PRACTITIONERS ON THE EVALUATION FRAMEWORK & MONITORING PROTOCOLS
- STATE-WIDE UPTAKE/ADOPTION BY ENTITIES INVOLVED WITH PERMITTING + DESIGN + CONSTRUCTION
- INCREASE IN IN-SITU MONITORING OF FEATURES USING THE PROTOCOLS
Process and Feedback

Helen Cheng, NY Sea Grant / Science and Resilience Institute at Jamaica Bay
NNBF Engagement

- Developing and revising framework
  - Gathering feedback on the project, framework, resilience service areas, and feasibility
    - Ecological Function
    - Haz. Mitigation and Structural Integrity
    - Socio-economic Outcomes
Timeline

Technical Working Groups (TWG)
- Winter/Spring 2018
  - Developed draft framework
  - Lit Review and previous projects/programs

Regional Working Groups (RWG)
- Summer 2018
  - Introduced draft framework
  - Gathered feedback
    - Hudson (June)
    - NYC (July)
    - Long Island (August)
    - Great Lakes (Sept)

Permit Reviewers Webinars
- Winter 2019
  - Introduced draft framework
  - Shared what we heard from the RWG
  - Gathered their feedback
Timeline

Revisiting the TWG
- Spring 2019
- Revised draft framework

Project Advisory Committee (PAC) Update
- Spring/Summer 2019
- Updated PAC on activities
- Gathering their feedback

Finished revised draft framework/ Pilot monitoring in regions
- Summer 2019
- Pilot monitoring in regions
Timeline

“Getting the word out”
- Fall 2019
- Presentation at the NY-NJ Annual Harbor Estuary Conference

Last round of framework revisions and develop database
- Fall 2019 / Winter 2020
  - Finalized monitoring framework*
  - Though this is a living document
  - Database development

NNBF Final Webinar
- Winter 2020
  - HERE WE ARE TODAY!
Regional Workshops

Data
○ How do we ensure consistency and use?
  • What is baseline?
  • How do we standardize?
  • How do we use, distribute?
  Who owns it?
  • What about specific site goals?

People
○ Roles
  • Who is the audience?
  • Who does this?
  • Who funds this?
Regional Workshops cont.

- Other common themes
  - Don’t reinvent the wheel (ie: use existing data)
  - Provide training and instruction, keep it simple
  - Is monitoring ‘forward-based’? Or ‘keeping track of things?’
Permit Reviewers

• Site-specific projects and regional differences
  • Each project: different characteristics, different purpose
  • Take into account projects nearby and their differences and/or intra-regional

• Compliance/ Enforcement
  • Can’t enforce something if it is not required out of the jurisdiction
    • Ie: private land owners aren’t going to be doing this type of monitoring
  • Lack of enforcement
  • Nobody wants to do more than they are required
  • Will not issue permits with voluntary conditions
  • --This was apparent for Socio-economic Outcomes Resilience Service
Permit Reviewers cont.

- Funders vs. Permit Reviewers Roles
  - There is support for state-funded monitoring programs
    - Fund demonstration projects
  - Funders require monitoring, not the permitters
    - Permitters don’t have an opening for this
  - Funding partners also monitor
PAC Feedback

• Establishing baseline
• A lot of the indicators having a timing component
  • I.e.: Census data happens every 10 years; how often are we collecting data, especially before and after installation of a project?
Selecting Parameters, Indicators, and Protocols

Dr. Peter Groffman
Brooklyn College
GOALS + METRICS
NNBF and the Knights who say Ni . . . :

- HEAD KNIGHT: You must return here with a shrubbery or else you will never pass through this wood alive!
- ARTHUR: O Knights of Ni, you are just and fair, and we will return with a shrubbery.
- HEAD KNIGHT: One that looks nice.
- ARTHUR: Of course.
- HEAD KNIGHT: And not too expensive.
- ARTHUR: Yes.
- HEAD KNIGHT: Now... go!
## FINAL MONITORING FRAMEWORK MATRIX

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<td>Shoreline location, intertidal zone definition, and shoreline change</td>
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<td>Change in Shoreline Position (at Feature and/or Updrift / Downdrift)</td>
<td>Erosion Measurements and Asset Displacement</td>
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<td>Quality of Life</td>
<td>Household Perception of Risk; Neighborhood Satisfaction (general &amp; as it relates to shoreline condition); Quality of Life</td>
<td>Household Survey</td>
<td>Household Survey</td>
<td>n/a</td>
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<td>Socio Economic Indicators</td>
<td>Change in Real Estate Value</td>
<td>Business Activity Index</td>
<td>Business Activity Index</td>
<td>n/a</td>
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<td>Real Estate Value Impacts</td>
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<td>Environmental Justice</td>
<td>Presence/Absence of Potential Environmental Justice Area</td>
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<tr>
<td>#</td>
<td>RESILIENCE SERVICE</td>
<td>PROTOCOL</td>
<td>TYPE</td>
<td>DESCRIPTION OF PROTOCOL</td>
<td>RELATED INDICATOR(S)</td>
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<tr>
<td>1</td>
<td>EF / HHGSI</td>
<td>Site and feature characterization (Site Questionnaire)</td>
<td>desktop and field</td>
<td>A protocol for determining the type of shoreline feature and describing its physical and biological context and adjacencies including adjacent land uses, evidence of erosion presence water intake or discharge pipes, vulnerable infrastructure, existing human uses, and fill/construction activity. The protocol draws on existing site information such as aerial imagery, prior surveys, as-built documents or input from people with local knowledge of the site as well as field observations.</td>
<td>All</td>
</tr>
<tr>
<td>2</td>
<td>EF / HHGSI</td>
<td>Feature-definition, location and serial dimension (desktop)</td>
<td>field</td>
<td>A protocol describing a protocol that uses existing remote sensed data (aerial imagery, LiDAR, etc.) to identify the “type” of site/feature for monitoring and establish the approximate location and extent of the monitoring site/feature prior to field monitoring.</td>
<td>All</td>
</tr>
<tr>
<td>3</td>
<td>EF / HHGSI</td>
<td>Feature Aerial Dimension (field)</td>
<td>field</td>
<td>A simple field measurement to map the serial dimension of the feature, and track changes from the documented baseline conditions.</td>
<td>Change in Feature Position and Elevation</td>
</tr>
<tr>
<td>4</td>
<td>EF / HHGSI</td>
<td>Shoreline location, intertidal zone definition, and shoreline change</td>
<td>field</td>
<td>Desktop analysis that evaluates the shoreline position using LiDAR or aerial imagery. If a time series of LiDAR or aerial imagery is available allows for the development of shoreline change over time.</td>
<td>Change in Shoreline Position</td>
</tr>
<tr>
<td>5</td>
<td>EF / HHGSI</td>
<td>Establishing Sample Scheme (including transect locations, etc.)</td>
<td>field</td>
<td>A protocol for planning and specifying the spatial layout of the sampling design for each site that will be used for multiple EF and HHGSI protocols. This includes determining the number of transects to be measured, identifying the number and location of potential profile lines within each segment and individual assessment points where measurements are made.</td>
<td>Most EF and HHGSI</td>
</tr>
<tr>
<td>6</td>
<td>HHGSI</td>
<td>Feature Elevation (field)</td>
<td>field</td>
<td>A field data collection protocol for identifying the feature elevation and measuring feature elevation change by mapping elevation profiles along permanent transects associated with the feature as well as adjacent reference location(s).</td>
<td>Change in Feature Position and Elevation</td>
</tr>
<tr>
<td>7</td>
<td>HHGSI</td>
<td>Erosion Measurements and Feature Displacement</td>
<td>field</td>
<td>A simple field measurement to evaluate the overall structural stability of the feature, and the degree to which the feature is abating shoreline erosion.</td>
<td>Mobile Source, Erosion, Escarpments, and/or Soil Degradation</td>
</tr>
<tr>
<td>8</td>
<td>HHGSI</td>
<td>Detailed Wave Measurement</td>
<td>field</td>
<td>An intensive protocol for making detailed wave measurements using acoustic or pressure-based wave measuring equipment. Requires monitoring equipment and qualified personnel to conduct.</td>
<td>Change in Wave Conditions</td>
</tr>
<tr>
<td>9</td>
<td>HHGSI</td>
<td>Coastal Flooding Data – Simplified</td>
<td>field</td>
<td>A simple field assessment of water levels, waves, and wave runup/strike around shoreline features. Complemented with the collection of desktop data intended to validate or support the field data.</td>
<td>Water Levels, Change in Wave Conditions</td>
</tr>
<tr>
<td>10</td>
<td>EF</td>
<td>Distribution and abundance of substrates including wrack, debris, concrete, etc. (in Combined Ecological Function Protocol)</td>
<td>field</td>
<td>A protocol to determine the distribution, abundance of different substrates on the transect (site) and assessment area (API) including wrack, debris, concrete, etc. Substrate refers to the ground surface and any non-living material on the ground, such as bedrock, bull kelp, seaweed, concrete, etc. Boulders (between 1 and 10 ft - basketball size) and sand/mud (0.1 in.), wrack, large woody debris.</td>
<td>Distribution and abundance of substrates including wrack, debris, concrete, etc</td>
</tr>
<tr>
<td>11</td>
<td>EF</td>
<td>Plant species cover, abundance, species richness and composition (in Combined Ecological Function Protocol)</td>
<td>field</td>
<td>A field protocol to record the cover, abundance, species richness and composition (including native versus invasive/endemic plant species). It requires plant identification skills.</td>
<td>Plant species cover, abundance, species richness and composition (including native versus exotic)</td>
</tr>
<tr>
<td>12</td>
<td>EF</td>
<td>Seaside organisms presence, abundance (percent) cover, species richness, and composition (in Combined Ecological Function Protocol)</td>
<td>field</td>
<td>A field protocol to assess the presence, abundance, richness and composition of sessile organisms/benthic fauna. Requires identification skills.</td>
<td>Seaside organisms presence, abundance, percent) cover, species richness, and composition</td>
</tr>
<tr>
<td>13</td>
<td>SEO</td>
<td>Business Activity Impacts</td>
<td>desktop</td>
<td>The protocol is designed to gather data on business activity surrounding a shoreline area and evaluate what, if any, impacts shoreline type, including investments in nature-based infrastructure projects, will have had on surrounding businesses.</td>
<td>Business Index</td>
</tr>
<tr>
<td>14</td>
<td>SEO</td>
<td>Real Estate Value Impacts</td>
<td>desktop</td>
<td>The protocol is designed to assess what, if any, impacts shoreline type, including investments in nature-based infrastructure projects, have had on surrounding real estate values.</td>
<td>Real Estate Value</td>
</tr>
<tr>
<td>15</td>
<td>SEO</td>
<td>Environmental Justice Index</td>
<td>desktop</td>
<td>We will determine whether the neighborhood around the shoreline intervention can be considered a potential environmental justice area (yes/no) and why (because of income/race/both).</td>
<td>Environmental Justice</td>
</tr>
<tr>
<td>16</td>
<td>SEO</td>
<td>Household Survey Protocol</td>
<td>field</td>
<td>The household survey protocol is a survey that addresses the following indicators for socio-economic outcomes: Neighborhood Satisfaction (Collective), Risk Perception (Quantitative), Quality of Life (Quantitative &amp; Qualitative), Household impacts by flooding (Quantitative &amp; Qualitative), Attitudes toward NNSF (Quantitative &amp; Qualitative).</td>
<td>Household perceptions: Recreation and Cultural Shoreline Use</td>
</tr>
<tr>
<td>17</td>
<td>SEO</td>
<td>Shoreline social and site assessment protocol</td>
<td>field</td>
<td>A rapid overview that includes human observation counts, signs of human use and randomized interviews with site users. This data is collected by using two questionnaires (supplementary materials attached).</td>
<td>Property Damage &amp; Cost of Recovery</td>
</tr>
</tbody>
</table>

**TO BE DEVELOPED IN FUTURE**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>field</td>
<td>Photo point monitoring consists of repeat photography of an area of interest over a period of time and is effective for documenting visual changes occurring at a fixed point over time.</td>
</tr>
<tr>
<td>field</td>
<td>Damage to Houses &amp; Public Infrastructure</td>
</tr>
<tr>
<td>Performance Parameter</td>
<td>Indicators</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Biological Health &amp; Biodiversity</td>
<td>Plant species cover, abundance, species richness and composition (including native versus exotic)</td>
</tr>
<tr>
<td></td>
<td>Sessile organisms presence, abundance, percent cover, species richness, composition</td>
</tr>
<tr>
<td></td>
<td>Distribution and abundance of substrates including wrack, debris, concrete, etc.</td>
</tr>
<tr>
<td>Habitat Connectivity</td>
<td>Habitat connectivity to adjacent areas, habitats, land uses in all directions</td>
</tr>
<tr>
<td>Hydrology</td>
<td>Visual evidence of hydrologic alteration</td>
</tr>
<tr>
<td></td>
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</tr>
</tbody>
</table>
# Hazard Mitigation

<table>
<thead>
<tr>
<th>Performance Parameter</th>
<th>Indicators</th>
<th>Associated Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Change in Feature Position and Elevation</td>
<td>Feature Elevation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feature Areal Dimension</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Erosion Measurements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Feature Displacement</td>
</tr>
<tr>
<td>Shoreline and topographic change</td>
<td>Change in Shoreline Position</td>
<td>Maps and GIS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change in Wave Conditions</td>
<td>Wave Height and Period Measurement</td>
</tr>
<tr>
<td>Coastal Flooding</td>
<td></td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td>Water Levels</td>
<td>Water Levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Tide data</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Structural Integrity</td>
<td>Change in Feature Position and Elevation</td>
<td>As above</td>
</tr>
<tr>
<td></td>
<td>Visible Scour, Erosion, Escarpments, and/or Material Degredation</td>
<td>Erosion Measurements</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Asset Displacement</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Site photolog</td>
</tr>
<tr>
<td></td>
<td>Change in Vegetation, Shellfish, or Other Biomass of Structure</td>
<td>see biological health and biodiversity protocols</td>
</tr>
</tbody>
</table>
# Socio-Economic

<table>
<thead>
<tr>
<th>Performance Parameter</th>
<th>Indicators</th>
<th>Associated Protocols</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quality of Life</strong></td>
<td>Household Perception of Risk, Neighborhood Satisfaction, Quality of Life</td>
<td>Field Protocols: Household Survey</td>
</tr>
<tr>
<td><strong>Recreation and Cultural Use</strong></td>
<td>Recreation and Cultural Shoreline Use</td>
<td>Field Protocols: Shoreline Social and Site Assessment</td>
</tr>
<tr>
<td><strong>Economic Development</strong></td>
<td>Change in Real Estate Value</td>
<td>Desktop Protocols: Real Estate Values</td>
</tr>
<tr>
<td></td>
<td>Business Activity Index</td>
<td>Field Protocols: Business Activity Impacts, Shoreline Social and Site Assessment</td>
</tr>
<tr>
<td></td>
<td># Households and public facilities exposed to flooding or erosion</td>
<td>Field Protocols: Household Survey</td>
</tr>
<tr>
<td><strong>Environmental Justice</strong></td>
<td>Presence/Absence</td>
<td>Desktop Protocols: Environmental Justice Index</td>
</tr>
<tr>
<td><strong>Civic Engagement</strong></td>
<td># People Participating in Shoreline Stewardship</td>
<td>Field Protocols: Shoreline Social and Site Assessment</td>
</tr>
</tbody>
</table>
Building on previous efforts:
Two questions going forward:

1. Are these NNBF “worth a damn”, i.e., are these features providing ecological function, hazard mitigation and socio-economic value?

2. Can our framework assess this value?

3. Can our framework assess changes in this value over time?

ARTHUR: Knights of Ni, we have brought you your shrubbery. May we go now?

HEAD KNIGHT: It is a good shrubbery. I like the laurels particularly . . .
Pilot Monitoring: Summer 2019

- 4 sites per region (16 sites total)
- NYC Parks will lead NYC/NY Harbor
- Group of graduate Fellows (led by SRIJB)
- Feedback on pilot monitoring will inform the Final Framework
Pilot Data Collection

Chris Haight, NYC Parks
Monitoring Questions

● Are the metrics and protocols feasible to implement?
  ○ Can different groups with different resources collect data successfully?
  ○ Can we collaborate with local partners?
  ○ Can the metrics and/or protocols be improved?

● Are the NNBF providing ecological function, hazard mitigation/structural stability, and socio-economic value?

● Does the framework assess NNBF value?

● Does the framework assess change in value over time?
Pilot Monitoring: Hudson Valley

- Coxsackie Boat Launch
- Coxsackie Wetland & Living Shoreline
- Peekskill Municipal Park
- Cold Spring Foundry Park
Pilot Monitoring: NYC

- Randall’s Island - Bronx Kill
- Randall’s Island - Living Shoreline
- Harlem River Park, Manhattan
- Bayswater Park, Queens
Pilot Monitoring: Great Lakes

Port Bay Barrier West, Wolcott
Port Bay Barrier East, Wolcott
Sodus Bay
Sterling Nature Center
Ecological Function
Structural Integrity and Hazard Mitigation
Socio-Economic
Lessons Learned

- Protocols can be implemented in the field and desktop
- Delineating the project boundary is challenging
- Streamline datasheets/protocols for the field
- Collaborating with local groups is highly valuable
  - Local knowledge of the site
  - Extra hands/equipment
  - Can be trained in protocol use
  - Potential longer-term monitoring
- Field logistics – weather and tide coordination
- Smart phones are a useful tool
- Timing per site
  - One to three days in field
  - One to three days in office
Monitoring Questions

● Are the metrics and protocols feasible to implement?
  ○ Can different groups with different resources collect data successfully?
  ○ Can we collaborate with local partners?
  ○ Can the metrics and/or protocols be improved?

● Are the NNBF providing ecological function, hazard mitigation/structural stability, and socio-economic value?

● Does the framework assess NNBF value?

● Does the framework assess change in value over time?
Database Development
Lessons Learned

- Communication between field monitoring team and data manager
- Documentation of data gaps
- Database can improve protocols and field data collection

Future of the Database

- Collect and add more data
- Database improvements
  - Data entry form/interface
  - Analytics, graphics/visuals
  - Data Queries
- Public-facing database
Discussion

(1) Open new window or use your smartphone
(2) Go to www.menti.com
(3) Enter code on screen : 66 02 36
Next Steps

Amanda Stevens, NYSERDA
Carolyn Fraioli, NYDOS
Dr. Brett Branco, SRIJB

For more information, contact:

Carolyn Fraioli, Carolyn.Fraioli@dos.ny.gov
or
Katie Graziano, KGraziano@srijb.org