Developing a Protocol to Assess the Habitat Value of Shorelines in the New York – New Jersey Harbor Estuary

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Context: regional interest and projects
Objectives: a repeatable means of comparison between ecologically-enhanced shoreline stabilization in an urban estuary

- Repeatable and safe
- Relatively easy and inexpensive
- Standard comparison across a range of urban conditions
Urban shoreline assessment: basic design

- Water quality
- Encrusting algae
- Sessile invertebrates
- Mobile invertebrates
- Bivalves
- Fish
- Photoquadrats
- Abiotic conditions
Urban shoreline assessment: challenges

- Cores not suitable for hard shorelines
- Quadrats, nets, suction samplers and epibiont scrapes
  - Require direct access to shorelines
  - Biased (?)
Urban shoreline assessment: invertebrate colonization device

- Standard surface area and submergence duration
- Steel crab trap
- Enclosed netting and brick - microhabitats
- Settlement plates for sessile invertebrates
- PVC piping to stabilize device
Deployment: colonization device position in water at low spring tide

Water level at low spring tide
Shorelines used in protocol development

- West Harlem Piers (3)
- Harlem River Park (1)
- Randalls Island (2)
Colonization device retrieval
To come: sessile invertebrates
Stress = 0.09, based on Bray-Curtis dissimilarity matrix of untransformed mobile invertebrate community data
Preliminary data: mobile invertebrates
Disadvantages of colonization device

- Device works on near vertical shoreline extending ≥ 2 meters below low tide
- Cage and settlement plate not always sturdy enough
- Differences in surfaces of settlement plates
- Least effective on low gradient shorelines or where hardened shoreline does not extend far below low tide level
- In upper Harbor, fine sediment often covers the subtidal hard substrate
Redesigned colonization device

- More durable
- More weight
- More secure settlement plates
- Settlement plate orientation varies
Next steps

• Refinement and validation
  - Suction sampler
  - Epibiont scrapes
  - Photoquadrats, where turbidity doesn’t preclude
• Implementation on a broader scale
• Better characterization of additional factors - sediment type, nearby habitats, wake
• Refinement of applications
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