

Solutions for Ecological Resiliency in Coastal City Design

ACES 2018: A Community on Ecosystem Services

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Washington, D.C.

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The Big U
Lower East Side, NYC

New Meadowlands
Meadowlands, NJ

Hunts Point Lifelines
South Bronx, NYC

**Resist, Delay, Store,
Discharge**
Hoboken, NJ

Living Breakwaters
Staten Island, NYC

Living with the Bay
Nassau County, NY

Resilient Bridgeport
Bridgeport, CT

Not pictured: Resilient Bridgeport
Image: "Rebuilding with Resilience" Report

- SOCIAL

- ECONOMIC

- ECOLOGICAL

1) Landscape Classification

Render the design ideas in the proposals transferable to future coastal resiliency projects by classifying the landscape types found in the projects

2) Assessment

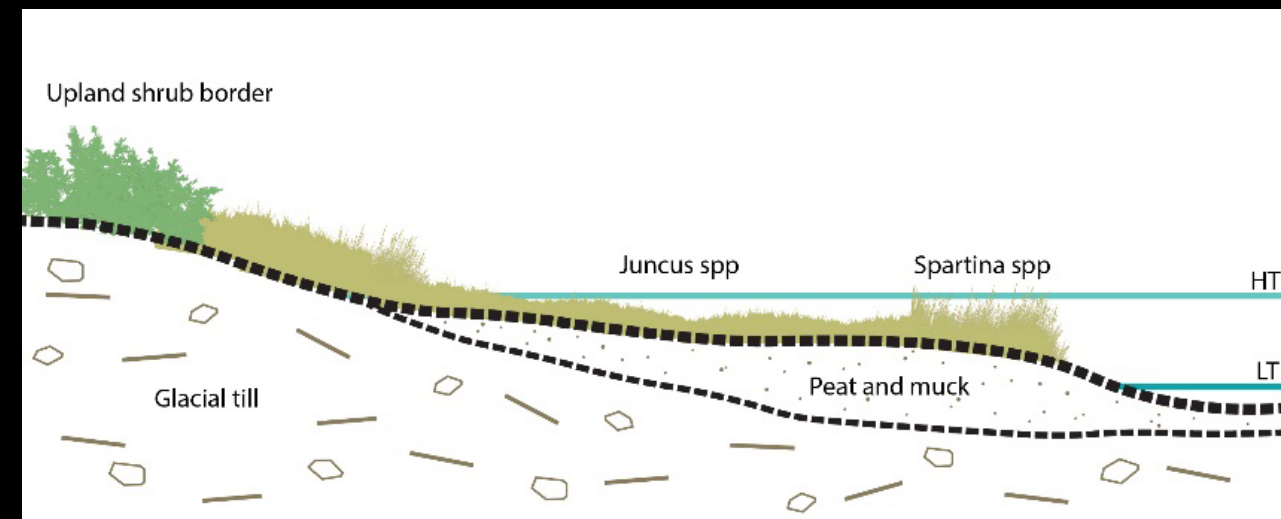
Identify the ecosystem services that unique design changes and associated ES that could be implemented in each landscape classification

Project landscapes

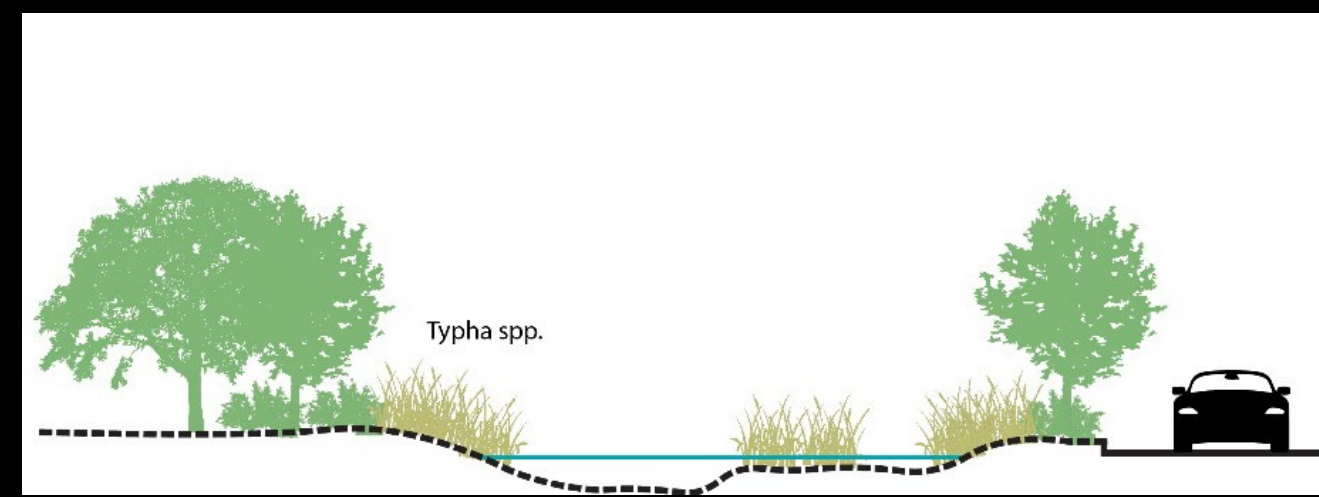


10 classifications:

Tidal saltwater marsh

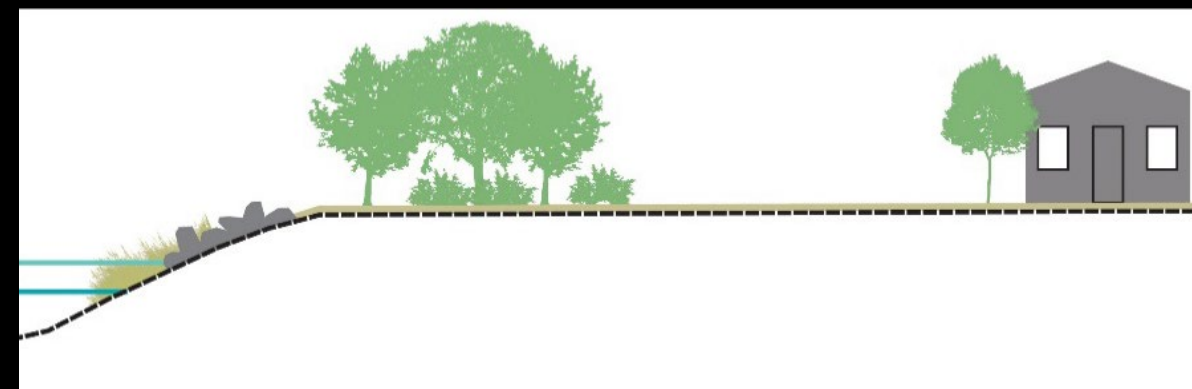


Non-tidal marsh

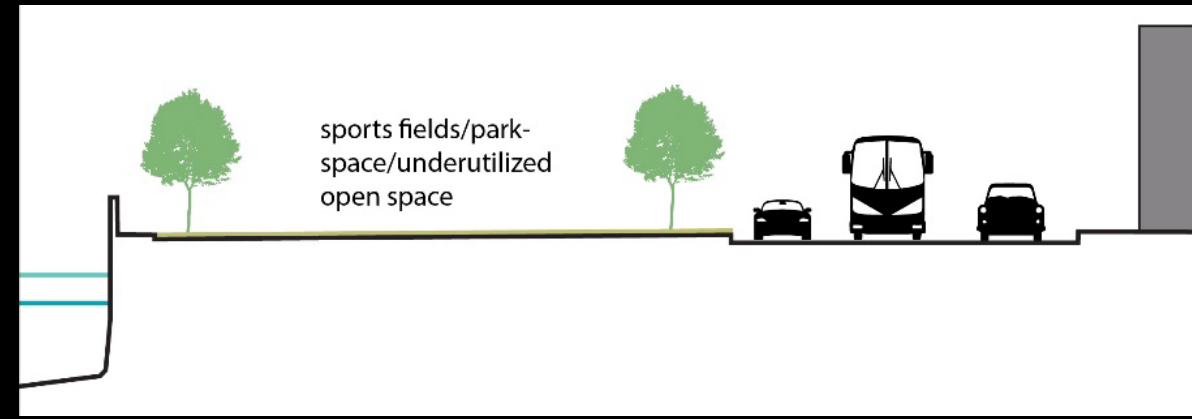


10 classifications:

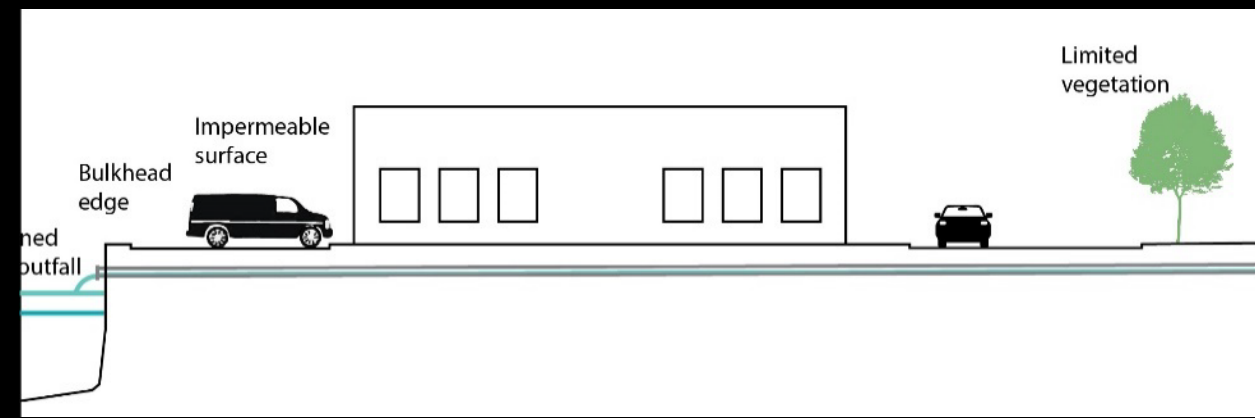
Lightly developed river edge



Moderately developed river edge

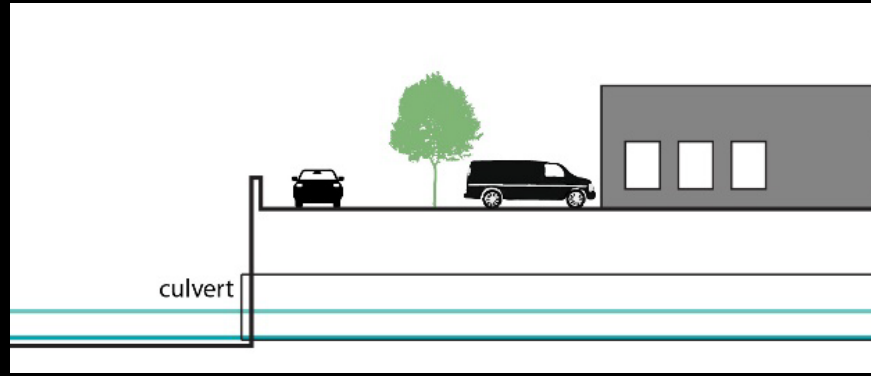


Densely developed river edge

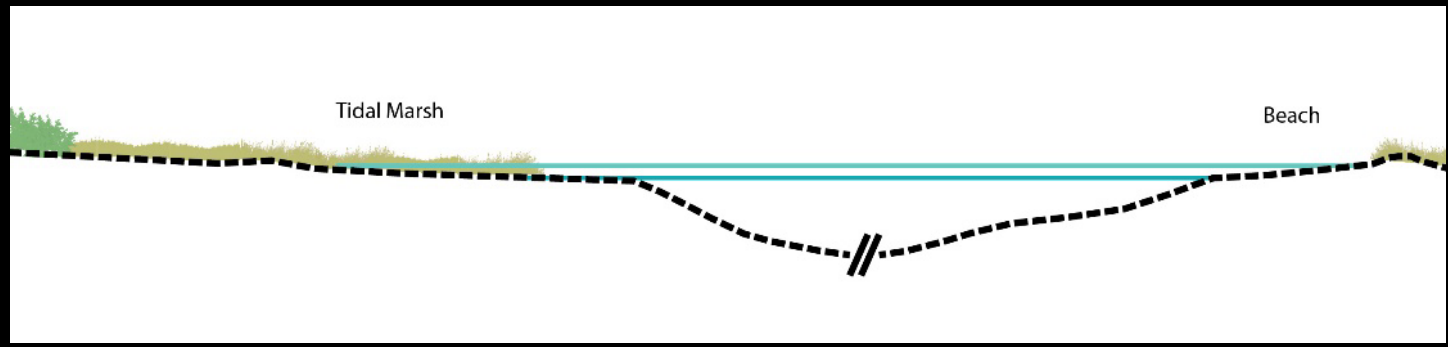


10 classifications:

Culverted waterway



Bay / sound shoreline

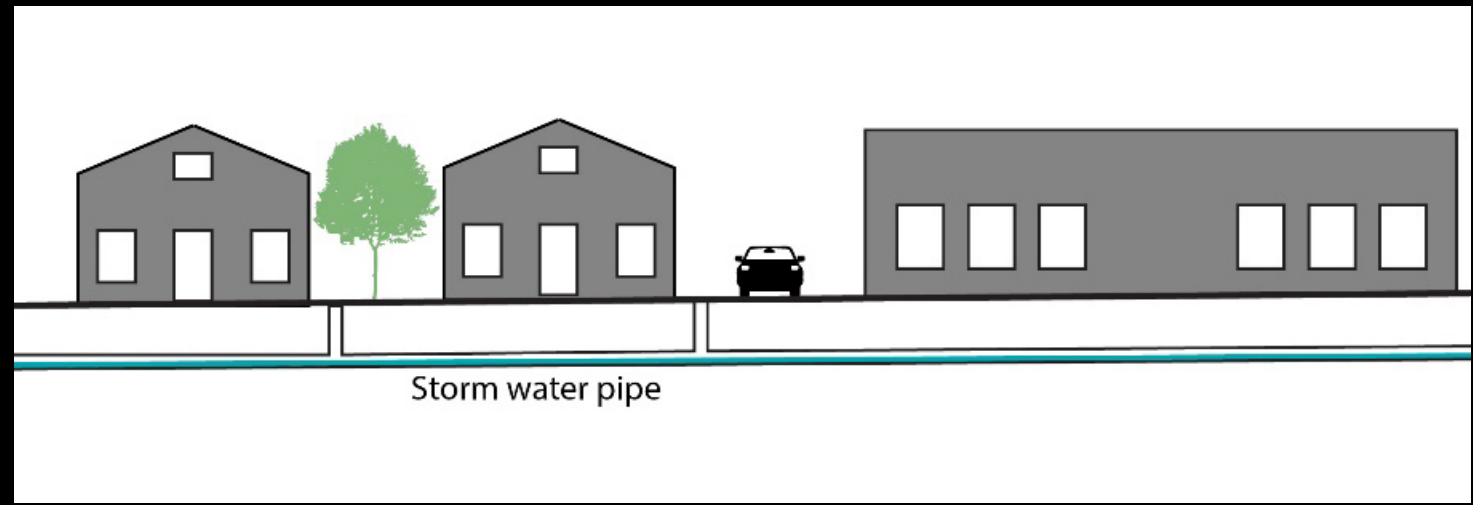


Barrier island

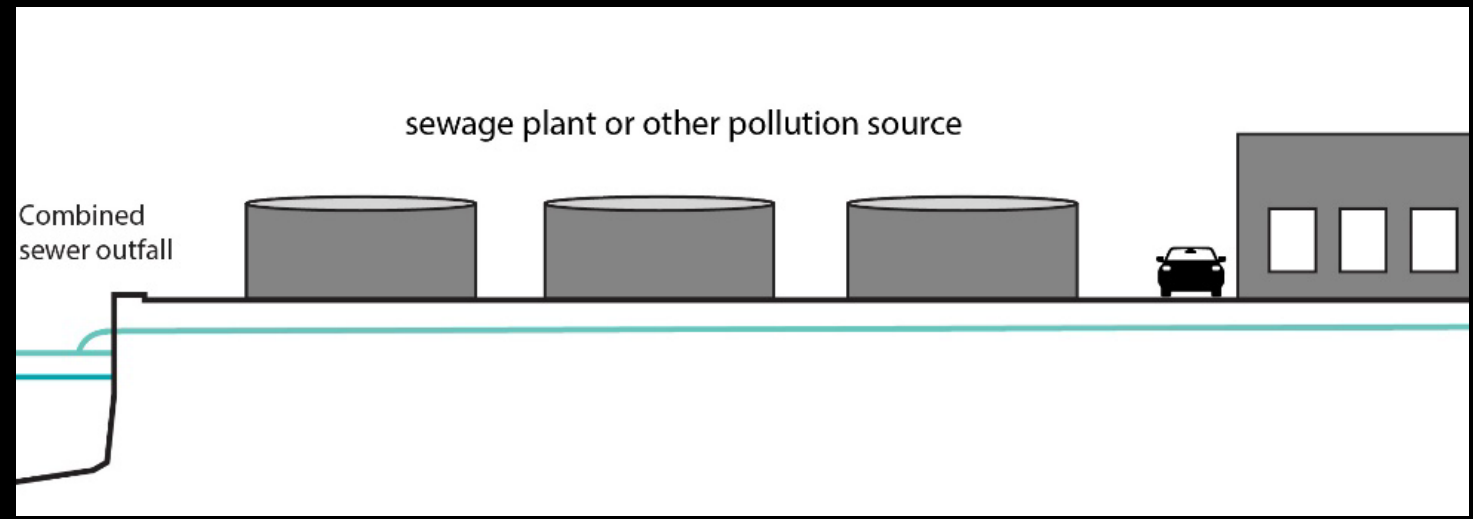


10 classifications:

Urban uplands



Large-scale pollution source near waterfront



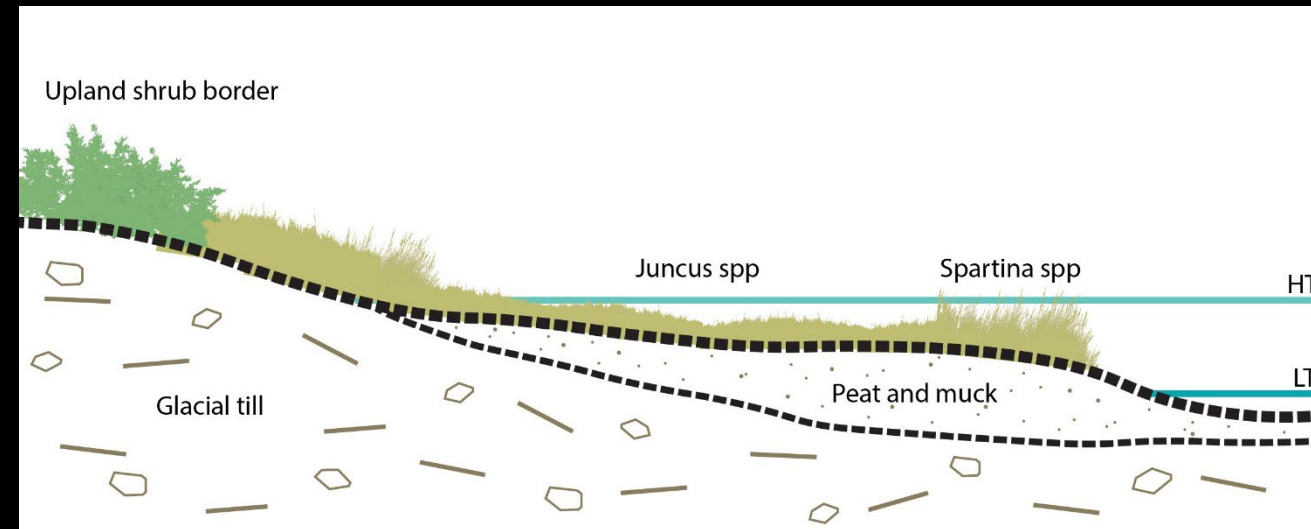
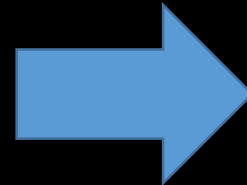
Example classification: Tidal marsh



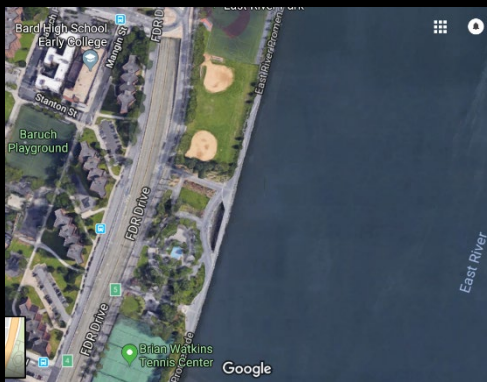
Cow Meadow Park
Freeport, NY (Living with the Bay)



Secaucus High School Marsh
Secaucus, NJ (The New Meadowlands)



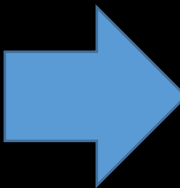
Example classification: **Moderately developed tidal river edge**



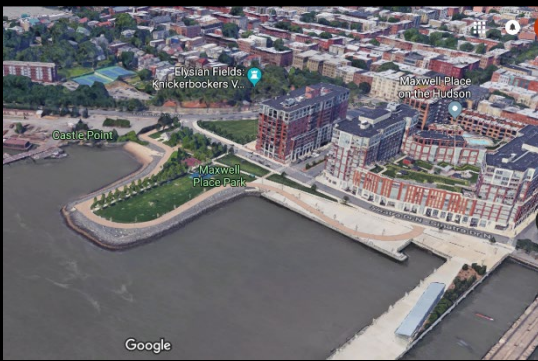
East River Park
LES, NYC (The Big U)



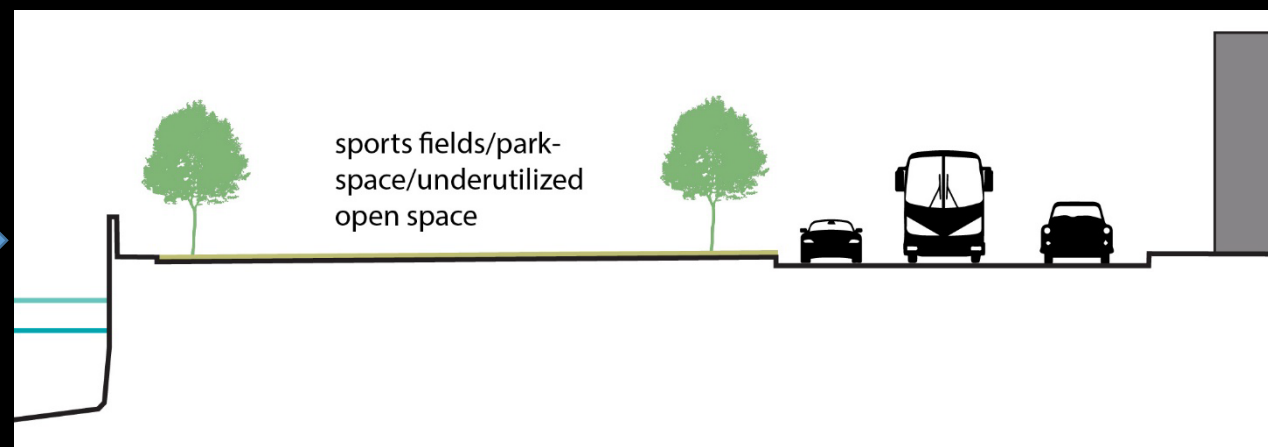
Rail yard on Mill River
Bridgeport, CT (Resilient Bridgeport)



Vacant lot on Bronx River
Hunts Point, NY (Hunts Point Lifelines)



Maxwell Place Park on Hudson River
Hoboken, NY (Resist Delay Store Discharge)

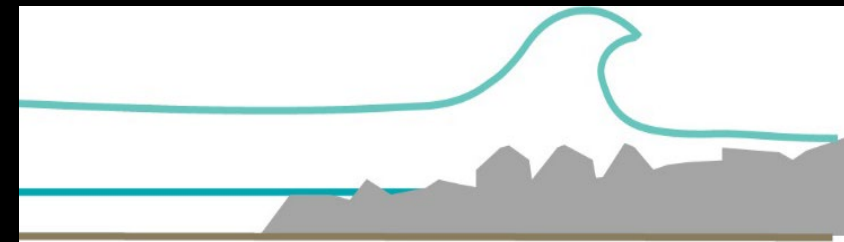


	Resilient Bridgeport	The Big U	New Meadowlands	Living with the Bay	Resist Delay Store Discharge	Living Breakwaters	Hunts Point Lifelines	Future study location
Tidal saltwater marsh			Y	Y				?
Non-tidal marsh			Y					?
Lightly developed river edge	Y							?
Moderately developed river edge	Y	Y			Y		Y	?
Heavily developed river edge	Y	Y			Y		Y	?
Bay/sound shoreline	Y			Y		Y		?
Culverted waterway	Y			Y				?
Urban uplands	Y	Y	Y	Y	Y		Y	?
Large-scale pollution source near waterway	Y							?
Barrier island	Y			Y				?



Image from Hunts Point Lifelines project proposal

- **54 unique design changes proposed**
 - Targeted to increase resilience and ecosystem services
 - Based on past design successes and modeling
 - Often teamed with ecologists and engineering firms to model expected outcomes



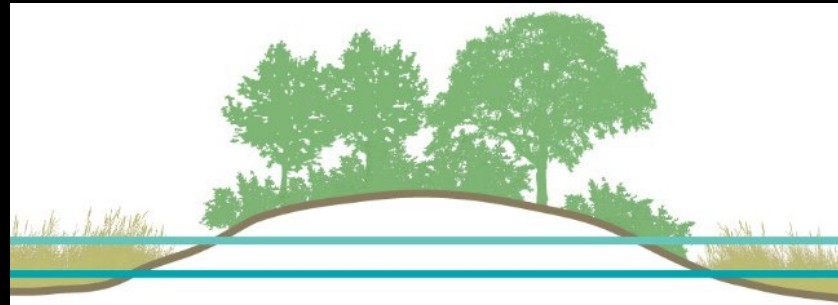
Ex 1: Exposed living breakwater

Regulating/ Maintenance ES:

- Flood protection
- Storm surge protection
- Water filtration

Supporting ES:

- Habitat provision



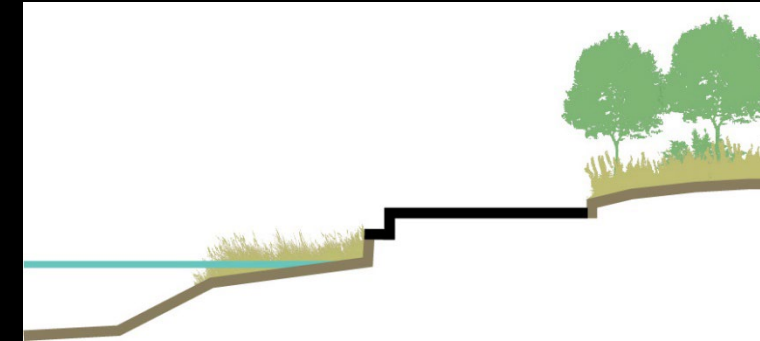
Ex 2: Constructed marsh island

Regulating/ Maintenance ES:

- Flood protection
- Storm surge protection
- Water filtration

Supporting ES:

- Habitat provision



Ex 3: Integrated greenway and flood protection

Regulating/ Maintenance ES:

- Flood protection
- Water filtration

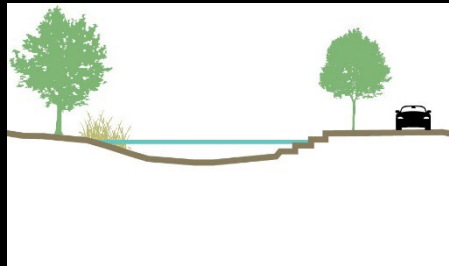
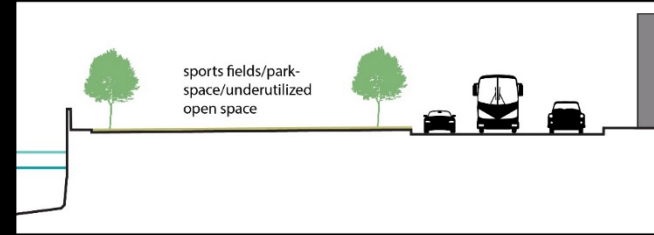
Supporting ES:

- Habitat provision

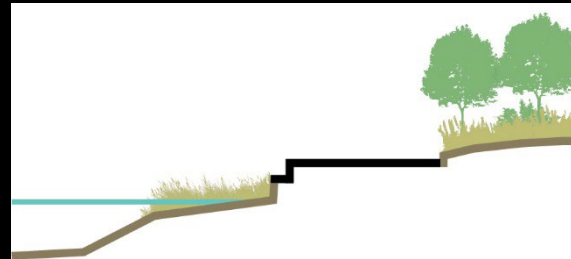
Cultural ES:

- Physical use
- Experiential use

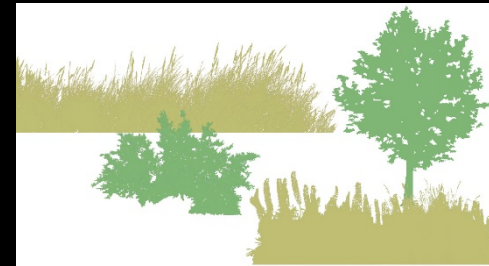
Example: Moderately developed river edge:



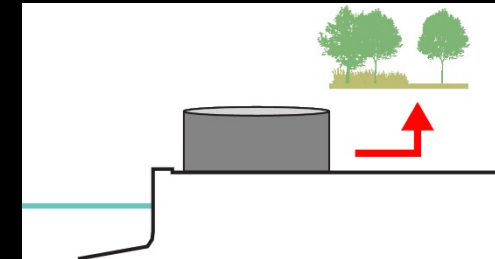
Terraced river edge



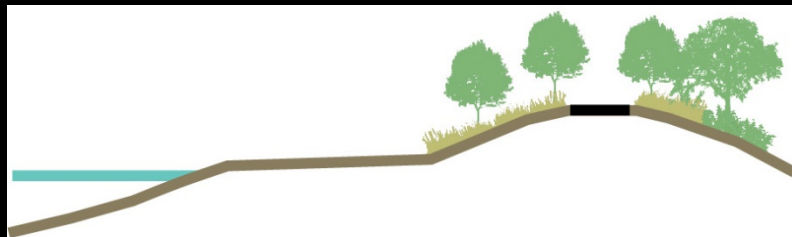
Integrated pedestrian greenway and flood protection



Native plantings



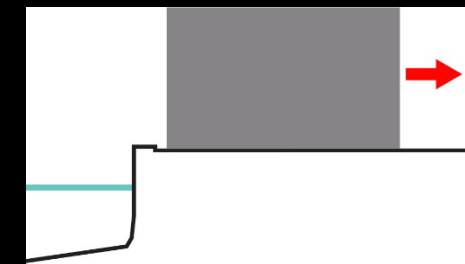
Restored brownfield



Vegetated flood berm



Water retention parkspace



Incentivized relocation of big box stores

- Transferability
- Legibility of ecosystem service benefits from specific design changes
- Advancement of landscape architecture student understanding of coastal resiliency and ecosystem services

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