

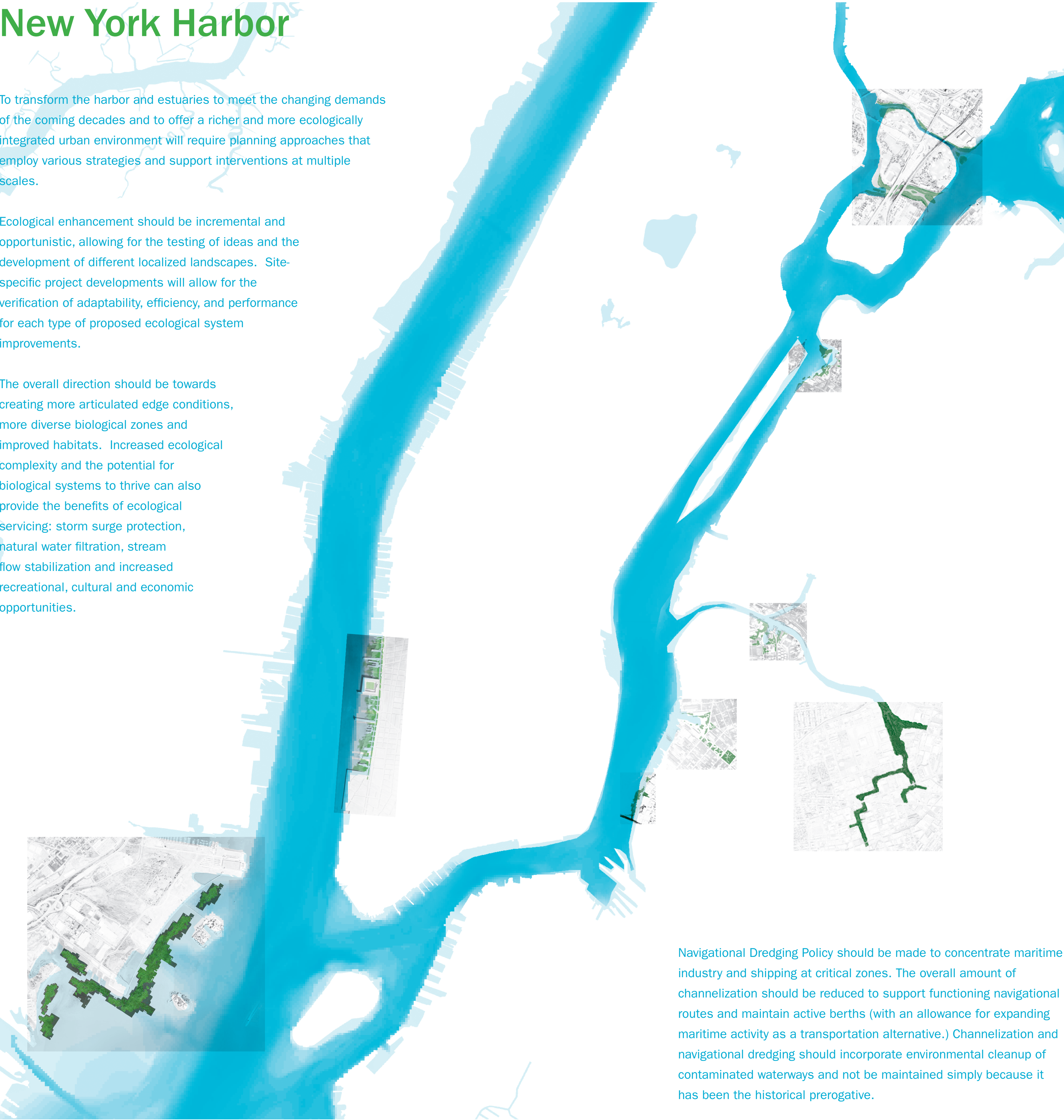
Enhancement of Estuary and Ecological System

New York Harbor

To transform the harbor and estuaries to meet the changing demands of the coming decades and to offer a richer and more ecologically integrated urban environment will require planning approaches that employ various strategies and support interventions at multiple scales.

Ecological enhancement should be incremental and opportunistic, allowing for the testing of ideas and the development of different localized landscapes. Site-specific project developments will allow for the verification of adaptability, efficiency, and performance for each type of proposed ecological system improvements.

The overall direction should be towards creating more articulated edge conditions, more diverse biological zones and improved habitats. Increased ecological complexity and the potential for biological systems to thrive can also provide the benefits of ecological servicing: storm surge protection, natural water filtration, stream flow stabilization and increased recreational, cultural and economic opportunities.



Strategies

Terraced Tidal Flats at Sea Walls

Floating Wetlands in Tidal Shallows

Upland Ecological Restoration

THE DEMANDS TO BE MET ARE MANY:

1. Rising sea levels, temperature rise and increasing storm intensity due to climate change
2. More robust storm surges and coastal flood potential
3. Increased population in NYC needing the benefits of natural systems.
4. Increased need for soft path servicing, ecological treatment of wastewater and passive water quality improvement methods.
5. Need for increased natural bio-diversity and re-establishment of wetland habitats.

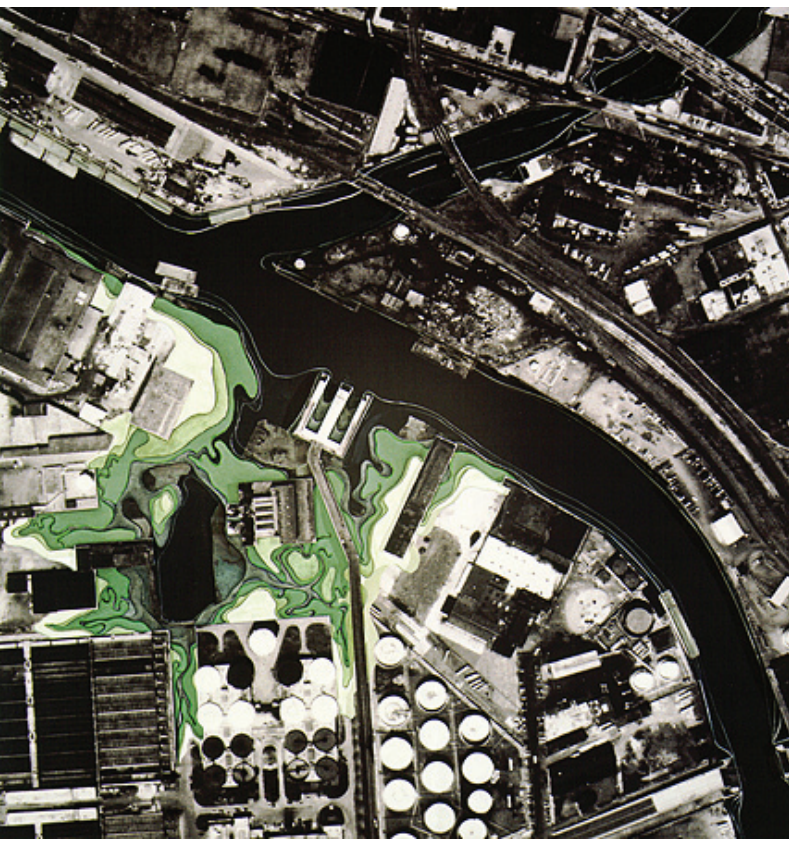
THE POSSIBILITIES FOR CREATING A BETTER CITY ARE MANY:

6. Inspired, aesthetic and humane urban landscapes and garden environments
7. Cultural, educational, and scientific facilities and study areas
8. Increased recreational and traditional park areas
9. General raising of the city's profile as a place of urban ecological adaptation and climate change mitigation
10. Increased real estate possibility in previously under valued or contaminated areas
11. Less reliance of fossil fuel based water treatment and storm water management
12. Increase desirability of small scale and diverse water based transportation options



BUSHWICK INLET

In the low lying land that defines the border between Greenpoint and Williamsburg is the Bushwick Inlet, the only remaining feature of a stream that once meandered inland about one mile, to the area around the present day McCarren Park. Many blocks within this area are post-industrial brown-fields. Inland restoration of this area proposes a park and wetland system organized around a winding stream and tidal flood plain carried out without de-mapping the existing city street system, allowing the grid to continue uninterrupted.



WHALE CREEK

The Whale Creek tributary was filled to provide land for petroleum industries seeking building sites along the Newtown Creek. The Whale Creek that once flowed into a salt marsh, currently ends at the Newtown Creek Wastewater Treatment Plant. Restoration of Whale Creek proposes to introduce broad shallow pools bordering mudflats and marshlands placing a wetland system in proximity to a centralized wastewater r facility. The wetland would act as a supplemental filtration system, working to clean overflow, urban run-off as well as a processed effluent and be a visible symbol of integrated infrastructure.



HALLET'S COVE

East and opposite the northern tip of Roosevelt Island is a calm part of the east River know as Hallet's cove. This natural inlet just south of the Hell Gate is defined and protected by the extension of land to the north, Hallet's point. The northern rocky shorelines were filled to expand the land area of Astoria. The proposal imagines island areas and near shore wetlands built of rock and earth platforms and through the excavation and shallow dredging of back-filled lands along the southwestern edge.



GRAND FERRY PARK

The Williamsburg Waterfront, between the Bushwick Inlet and the Williamsburg Bridge, is an industrial seawall. Where Grand Street meets the shore however, the seawall is broken by a small riprap section of boulders. While providing protection for the 1.6 acres of the Grand Ferry Park from the impact of tides, this rocky edge provides a coveted direct connection with the East River. The conversion of riprap to coastal shoal and the introduction of floating wetlands proposes a limited conversion of hard parkland edge to a vegetated coastline.



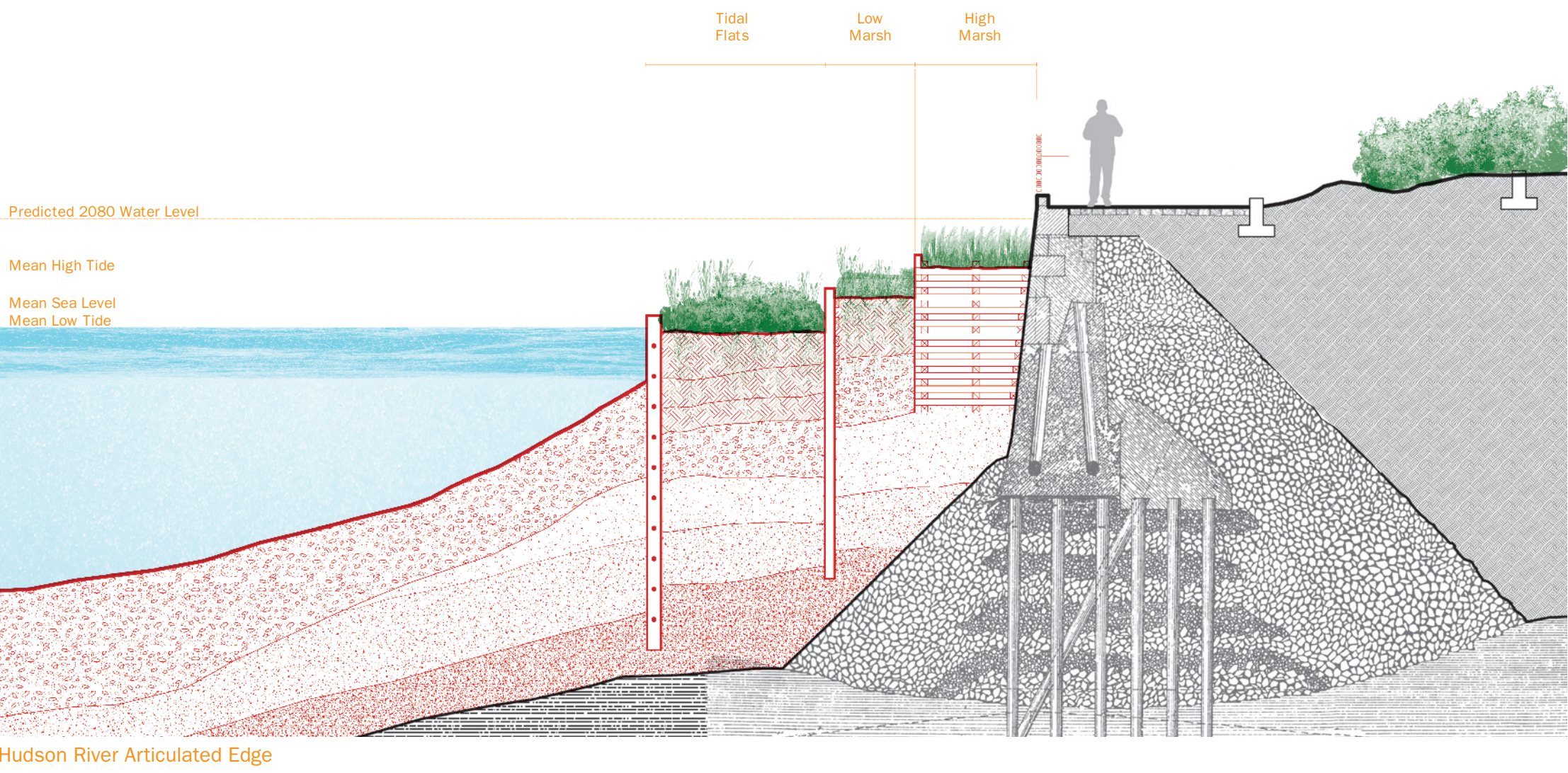
Historic Tidelands 1815



Tideland Conditions 2008

Terraced Tidal Flats at Sea Walls

This Ecological restoration strategy calls for the re-programming of some sections of the hardened shorelines. The continuous seawalls that once provided for deep-water berths along much of the harbor have largely outlived their maritime industrial usefulness. These stone and concrete structures created a simplified edge condition where water and land have no inter-action, eliminating the critical near shore habitats of the tidal wetlands. This proposed strategy involves building stepped tidal flats along sea walls that are no longer used for navigation.

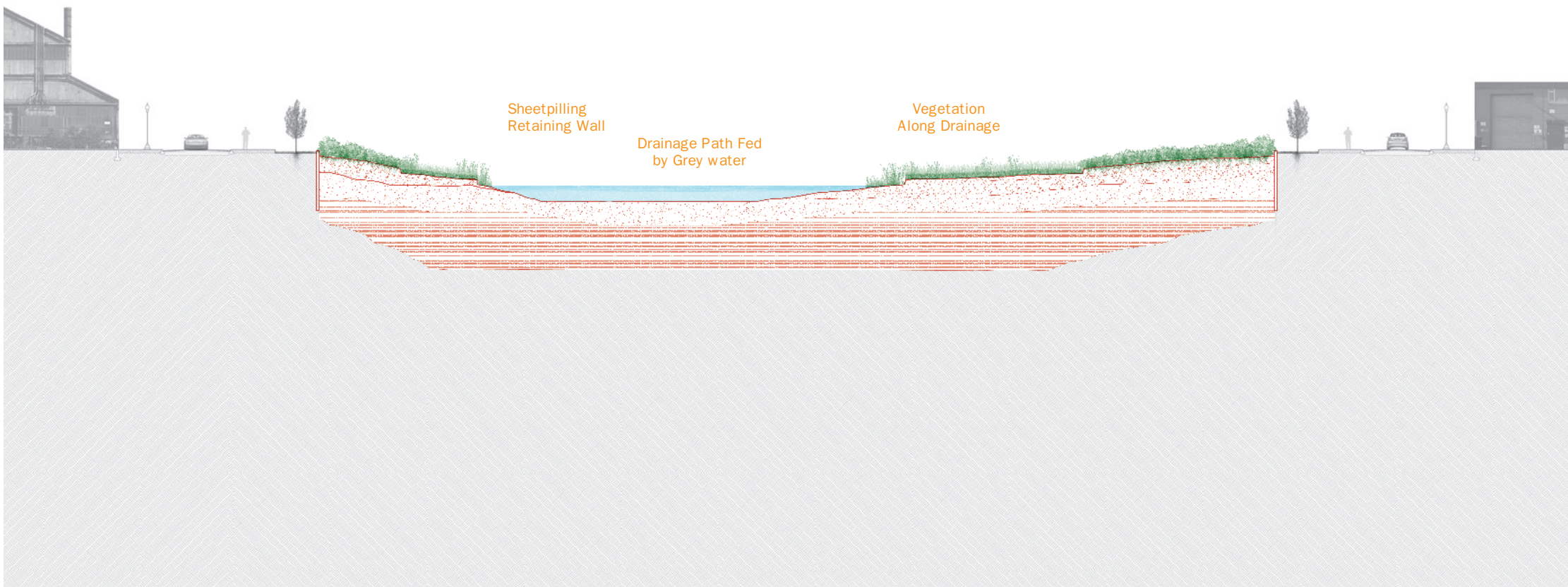


Hudson River Tidal Steps

One Prize Registration #130

Upland Ecological Restoration

Strategies for upland ecological restoration propose to incrementally re-introduce fragments of the historic network of water-based natural systems within the grid of the existing infrastructure. The near shore drainages of the New York harbor have endured the radical transformations that urban development, shipping and waterfront industries have imposed. Tranquil water features once occupied places like the Bushwick Creek, Newtown Creek and Hallet's Cove, all places where water met land at an indeterminate edge. By cutting into the modern map of the city, lost indications of natural land and water forms could establish new possibilities for open space and urban ecosystems.



Section Showing typical enhancement to existing seawall



Newtown Creek Infill Landscape

NEWTOWN CREEK

Newtown Creek, the most extensive of the East River estuaries, was designated a Superfund site in 2010. The toxic legacy and the limited exchange of oxygen and water in the upper reaches and tributaries of the Newtown Creek leave a stagnant winding channel that offers little hope of ecological restoration.

The upper reaches of Newtown Creek, from the English Kills to Whale Creek, is best treated by a protocol of remediation and then filled and converted to green space. Below the filed area, in and around the Newtown Creek Water Pollution Control Plant, smaller wetland features can be developed. This progression of upland green space to wetland to river would allow some preservation of the water feature (in closer proximity to the tidal currents of the East River), would provide green space in a bleak post industrial landscape and would save environmental restoration funds for more important and productive objectives.

Upland development should also consider the filling of water assets that are deemed undesirable and not worth the commitment of scarce environmental funding resources. The upper reaches of the Newtown Creek and the English kills are a Superfund site that is best remediated, filled and converted to green space. The toxic legacy and the limited exchange of water leave a stagnant basin that offers little hope as a beneficial, water-based environment.



Restoration of Little Hell's Gate

LITTLE HELL GATE

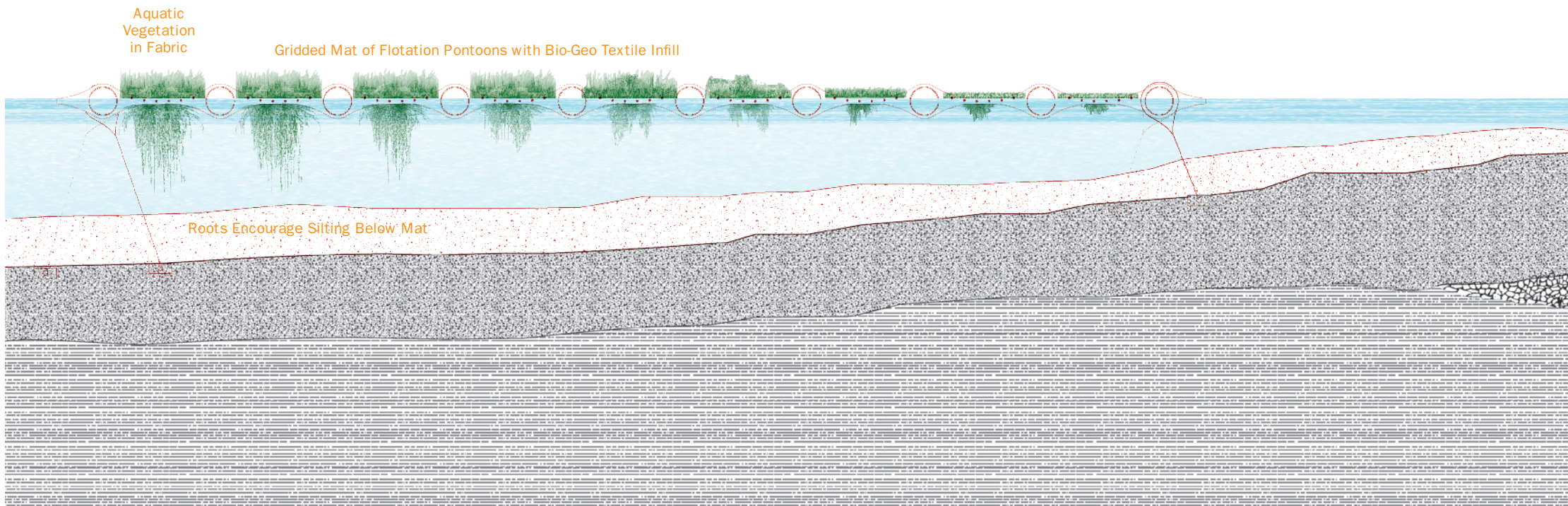
In 1934 Robert Moses ordered the area between Ward's Island and Randall's Island, a channel known as the Little Hell Gate, filled to increase the area of playing fields in the then developing Ward's Island sports park. The wetlands between Randall's Island and the Bronx, The Bronx Kills, were also channelized. The modern area of the obscured Little Hell Gate remains a low-lying area and an under utilized part of the park, and the adjacent Ward's Island Water Pollution Control Plant. The area of the old waterway is now used for primarily for parking and minor structures. The restoration of the Little Hell Gate proposes to open the channel and establish wetlands along the shore and at the eastern mouth of the channel.

Floating Wetlands in Tidal Shallows

The floating bio-mat proposal envisions a 21st century version of the ancient Mesoamerican Chinampa method of agricultural floating islands. Protected tidal shallow areas outside the areas dredged for navigation provide the opportunity for passive island making. The buoyant structural grids, filled with vegetated bio mats, are secured with cables to submerged anchors and stabilized with wooden piles,

allowing for movement with the tides. In time, as the vegetation roots down, the system will force the accumulation of silt, and the anchored island, grow the energy of the currents, builds estuarine inter-tidal marshlands.

One critical plant species to the proposed bio-mat is eelgrass, an underwater plant able to tolerate brackish water and multiply in various substrates and moderate range of lighting conditions. Eelgrass functions to reduce erosion, stabilize sediment and remove nitrogen.



Section Showing typical enhancement to existing seawall



Hudson River Floating Island

HUDSON RIVER FLOATING ISLAND

The floating wetlands could be used as a supplemental or alternative strategy at sea walls no longer being used for shipping. These could be used alone (as shown) or in combination with terraced tidal flats. The floating islands offer the advantage that they can be deployed with minimal hard infrastructure, could be seen as an interim solution to increase marshland and sea grass habitat and could be removed if maritime operations needed to reclaim shoreline frontage.



Oyster Bay Restoration

COMMUNIPAW COVE (OYSTER SALT MARSH)

Communipaw Cove is one of the few remaining tidal salt marshes within the Hudson Raritan Harbor Estuary. Currently located within Liberty State Park, these tidal flats once supporting vast oyster beds that were a major source of protein to the indigenous populations and early New Yorker's. The oyster flats were progressively cleared and in-filled as the area developed into a transportation hub for the Central Railroad of New Jersey. The proposal for Communipaw Cove tidal shallows is to deploy floating bio-mats, allow and promote passive island making and the gradual growth and health of an ecosystem that can once again support aquatic species.