



ENHANCEMENT OF NEW YORK HARBOR ESTUARIES AND ECOLOGICAL SYSTEMS

PROPOSALS FOR ENVIRONMENTAL RESTORATION

**CUISD HONORABLE MENTION
SUBMISSION TO AN OPEN
INTERNATIONAL DESIGN COMPETITION
TO ENVISION WATER AS THE THE SIXTH
BOROUGH OF NEW YORK CITY
MAY, 2011**



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INTRODUCTION

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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.

Navigational Dredging Policy should be made to concentrate maritime industry and shipping at critical zones. The overall amount of channelization should be reduced to support functioning navigational routes and maintain active berths (with an allowance for expanding maritime activity as a transportation alternative.) Channelization and navigational dredging should incorporate environmental cleanup of contaminated waterways and not be maintained simply because it has been the historical prerogative

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.

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:

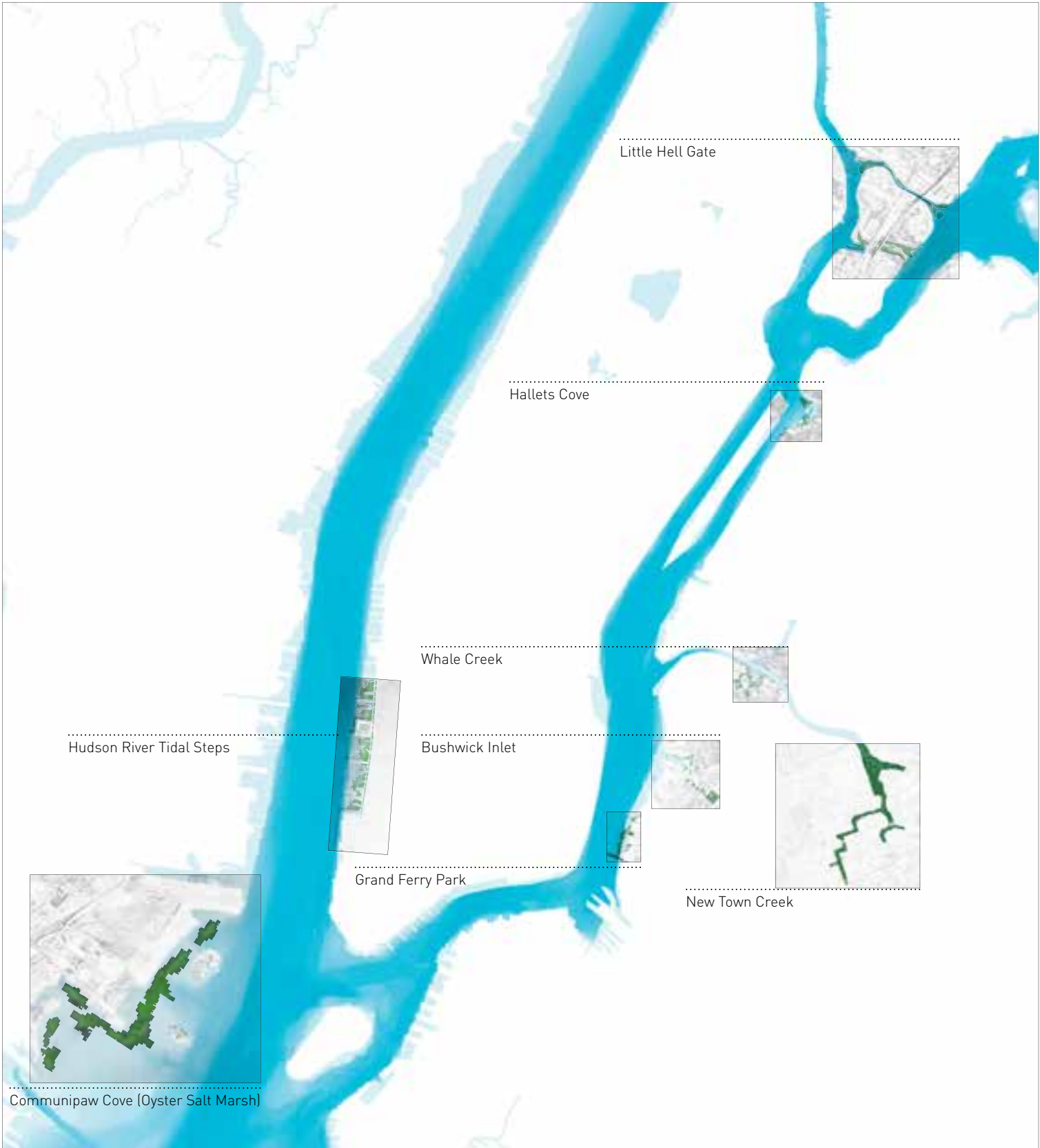
1. Inspired, aesthetic and humane urban landscapes and garden environments
2. Cultural, educational, and scientific facilities and study areas
3. Increased recreational and traditional park areas
4. General raising of the city's profile as a place of urban ecological adaptation and climate change mitigation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



Historic Tidelands 1815



Tideland Conditions 2008



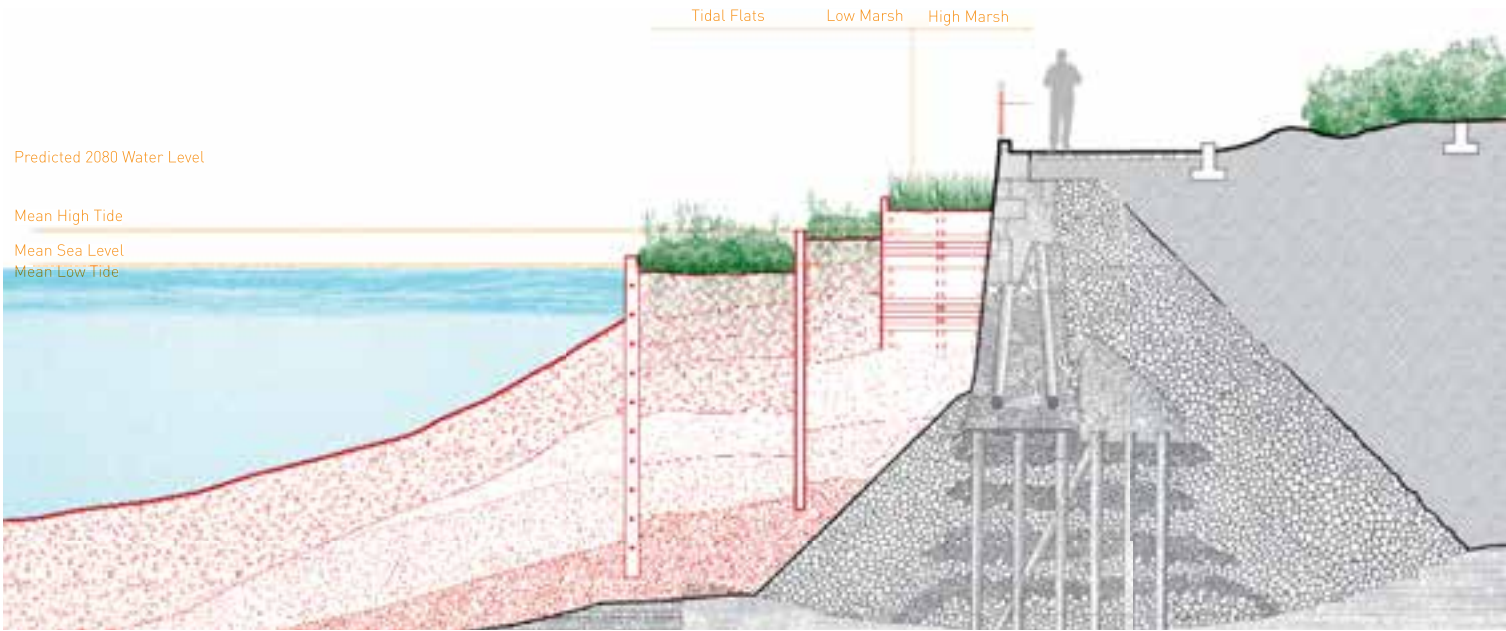
THREE STRATEGIES

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

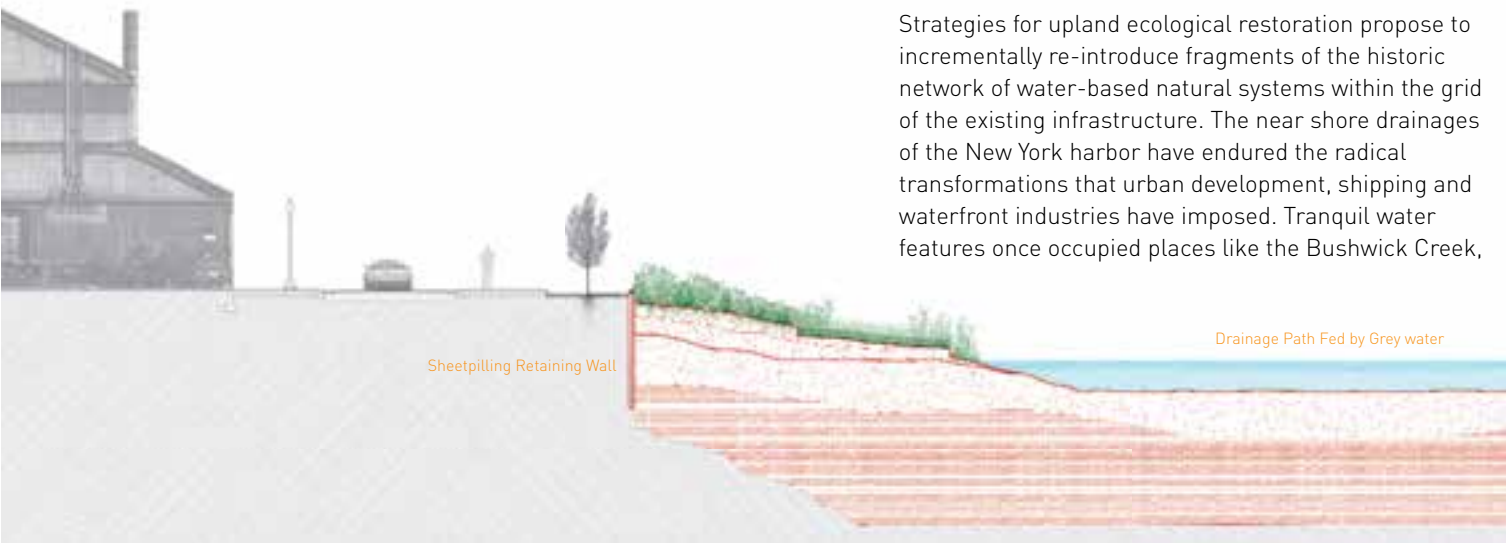
largely outlived their maritime industrial usefulness. These stone and concrete structures created a simplified edge condition where water and land have no inter-action, eliminating the critical near shore habitats of the tidal wetlands. This proposed strategy involves building stepped tidal flats along sea walls that are no longer used for navigation.

Critical to wetland ecology is the diverse plant life that takes root therein. Most of these species are characteristically able to thrive under the fluctuating salinity, water cycles and sediment deposits of the wetland. This tiered proposal in the Lower Hudson River would attempt to introduce more robust wetland species such as eelgrass, which can thrive in the particular water cycle and climactic conditions of this location. This process necessitates experimentation, site-specific phasing and close observation in order establish a sustaining ecosystem.



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,

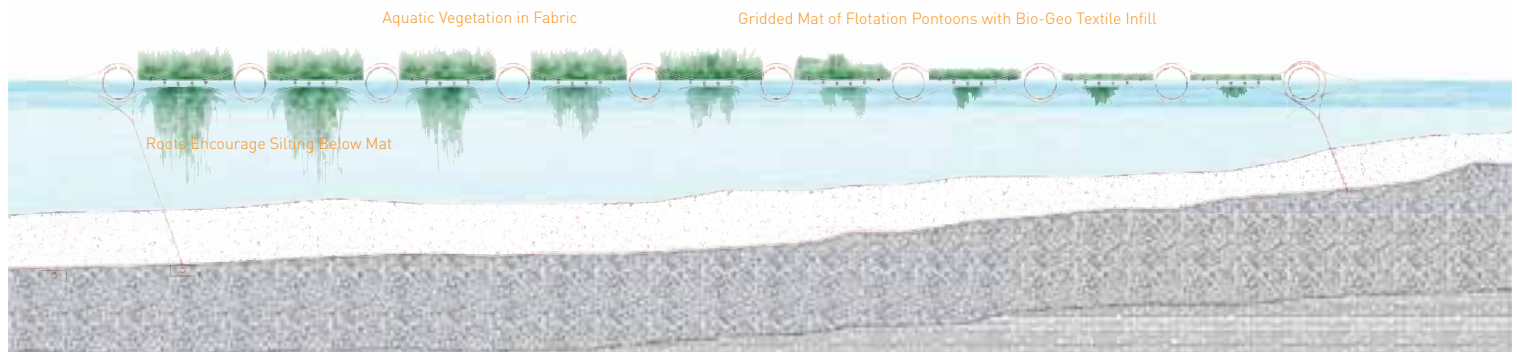


FLOATING WETLANDS IN TIDAL SHALLOWS

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

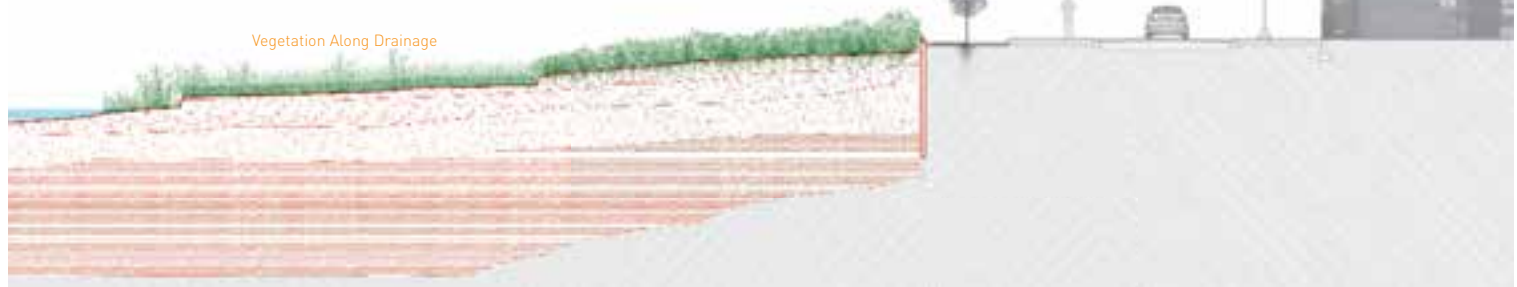
provide the opportunity for passive island making. The buoyant structural grids, filled with vegetated bio mats, are secured with cables to submerged anchors and stabilized with wooden piles, allowing for movement with the tides. In time, as the vegetation roots down, the system will force the accumulation 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.



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.

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.



THE SITES



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.



HUDSON RIVER TIDAL STEPS

Envisioned along the monumental sea wall of the Lower Hudson River, the stepped forms of the new architecture create an essential topography of changing depths and multiple shelves, where aquatic and terrestrial life interact. The new landscape increases the amount of green space and enhances the naturalized aesthetic of what is becoming lower Manhattan's most important park and open space.



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.



THE SITES

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.





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.



SITES UTILIZING MULTIPLE STRATEGIES



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 treatment 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.



THE SITES

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.



THE SUBMISSION

COOPER UNION INSTITUTE FOR SUSTAINABLE DESIGN TEAM LED BY KEVIN BONE ALONG WITH AL APPLETON, ZULAIKHA AYUB, PAUL DEPPE, SUNNIE JOH, JOE LEVINE, RAYE LEVINE, AND ARNOLD WU

The project was awarded one of 5 prizes - honorable mention.

The proposal appealed to the judges for its goal to treat the city's water, air, and vulnerability to storm surge and sea level rise with comprehensive plan to soften the length and breadth of the city's shoreline with new habitats and parkways. In strong contrast to W.O.W., Enhancement of Estuary purely approached issues of ecology and strengthening the Hudson River Estuary against environmental harm.

There was widespread enthusiasm amongst jury members for the focus and dedication to biology and the clear positive impact the project would have on the Hudson River Estuary. The extensive and invasive nature of the project excited some and deterred others. Charles McKinney enthusiastically remarked that "it does point out the difference between a demonstration project and something that is at the real scale of what needs to happen".



Presentation Panels Submitted by the Institute of Sustainable Design

OPEN INTERNATIONAL DESIGN COMPETITION TO ENVISION WATER AS THE SIXTH BOROUGH OF NEW YORK CITY

ONE PRIZE is an annual design and science award to promote green design in cities. ONE PRIZE 2011 turned its focus to New York and its waterways, re-imagining recreational space, public transportation, local industry, and native environment in the city. Contestants proposed designs for the NYC BLUE NETWORK and the E3NYC CLEAN TECH WORLD EXPO by expanding waterborne transportation and linking the five boroughs with a series of green transit hubs as well as providing in-water recreation, water-oriented educational, cultural and commercial activities, and demonstrations of clean technology and renewable energy.

The jury panel included Amanda Burden, New York City Planning Commissioner; Charles McKinney, Principal Urban Designer NYC Parks Department; Michael Colgrove of New York State Energy Research and Development Authority (NYSERDA); Helena Durst of the Durst Organization; Matthias Hollwich of Architizer; Bjarke Ingels of BIG; Roland Lewis of the Metropolitan Waterfront Alliance; Roberta Weisbrod of Sustainable Ports; Kate Ascher of Buro Happold Consulting; James Corner of Field Operations; David Gouverneur of the University of Pennsylvania; and Victoria Marshall of Parsons School of Design.

Prizes were given to many young architects and designers who submitted the four selected entries. The grand prize winners, Ali Fard and Ghazal Jafari are both recent graduates of the University of Toronto. The three honorable mention teams are the Cooper Union Institute for Sustainable Design led by Kevin Bone, an entrepreneurial design practice RUX Design, New York, and a group of recent graduates from the University of Colorado, Boulder.

