

# ECO - WHARVES

## AQUAPONIC FARM & URBAN BEACH

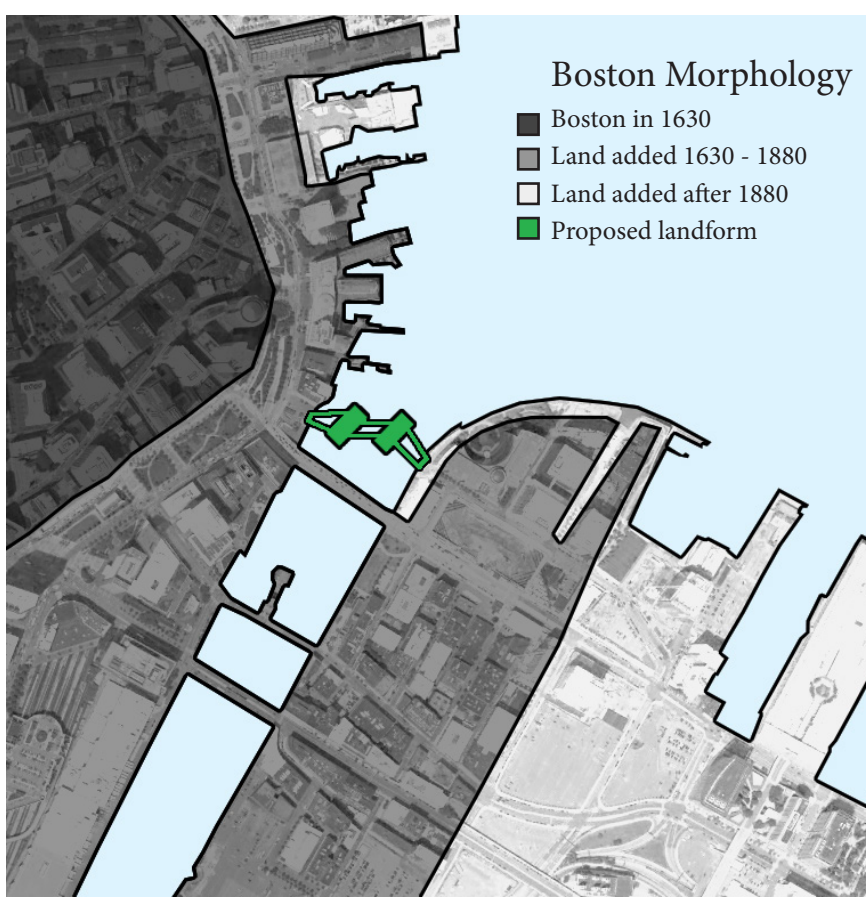
exploring a model of sustainable development to reclaim the waterfront for people and the environment

With the rising threats of climate change and the growing need for cities to become more self-sufficient, our attitude towards new construction will have to change. The proposal is a less invasive structure that recognizes and responds to the environmental forces at play in order to create a unique destination at the waterfront. The greenhouses created are mostly a closed ecosystem of symbiosis between farmed fish and plants that produce nitrates as nutrients for a hydroponic system that in turn filters the water for the fish tanks. A café and event space allow the public to interact with the agriculture program in order to educate them about sustainable food production. Green spaces wrap around the glass structure to insulate the space within, offering added paths and rest areas for pedestrians.

A problem with sustainable development is not just the construction process; in numerous cases demolition of old structures can pose just as many environmental challenges. In urban areas debris typically has to be transported long distances to landfills. Our proposal to demolish the Northern Avenue Bridge calls to reclaim some of the structure within the landscaping of the parks and urban beach. The bulk of the former, steel truss is to be transformed into an artificial reef at the mouth of the channel. This works in conjunction with the bioswale created on shore to create new habitats for native species and reintroduce the wetland ecosystem back within Boston's cityscape.

Originally a tidal marsh region, Boston's landscape has transformed tremendously over the last three centuries and continues to do so. The pattern of landfill projects during this timeline reveals much about the city's morphology and exponential growth along the waterfront. Using innovative techniques during the late nineteenth century, hills of the surrounding landscape were excavated and moved into coves, eliminating many of the wetlands and ecosystems. Stretching across the mouth of the Fort Point Channel, once a tidal creek that was cumulatively filled and developed into a canal, the Northern Avenue Bridge not only tells the story of the industrial age in this urban setting, but also represents a physical and metaphorical link to these topographical interventions and their history of expansion.

The call for a bridge to replace the existing steel, truss structure that spans these manmade landforms provides an opportunity to create a new design that is more representative of our time. By harnessing sustainable, technological innovations and employing these instruments to form a more modern typology, the relationship between city and seafont can start to be redefined in a more symbiotic way. This connection intends on being a continuation of the industrial and geological history of Boston, but as opposed to using the redistribution of land to erect more substantial structures on permanent terrain, a less invasive strategy is employed to rehabilitate part of the natural ecosystems that were once lost to landfill construction.



To achieve a new topography in the seaport, an adaptive reuse system of barges and shipping containers are used to create more environmentally friendly landforms, allowing the channel to flow in and around these fabricated islands. The buoyant formations are linked together with low-rise profile bridges, which are supported on tubular steel struts bolted to pairs of pontoon floats sitting transversely underneath the arching planes. Pedestrian and bicycle paths are physically separated into two different lanes of travel, breaking down the scale of the overall structure and creating for a more dynamic and free-flowing network of movement. The bridged, elongated barges, mimicking the typology of wharves along the perimeter of Boston harbor, become a means of travel between two downtown districts and, more importantly, a destination in their own right. Along the shore, bioswales are implemented to control and filter urban runoff, as well as visually connect the JFK Greenway to the South Bay Harbor Trail. The activation of these floating land masses and their counterparts in the neighboring shores play a vital role in developing a language of reviving the natural environment, addressing urban agriculture, and engaging the public to living sustainably in the city.

