Prepared by A. Frankic
And her CZM Class'10

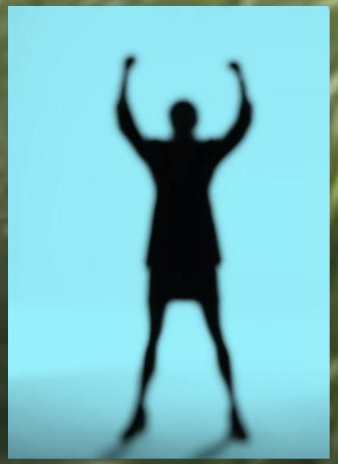
Green Boston Harbor

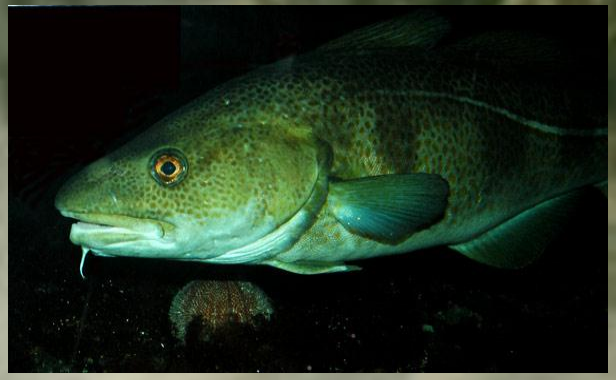
www.gbh.umb.edu

What is the vision for coastal urban areas?
What is the future for Boston and surrounding waters?

Overlay maps of past and present Boston Harbor with filled coastal areas

We are all connected and interdependent on each other;

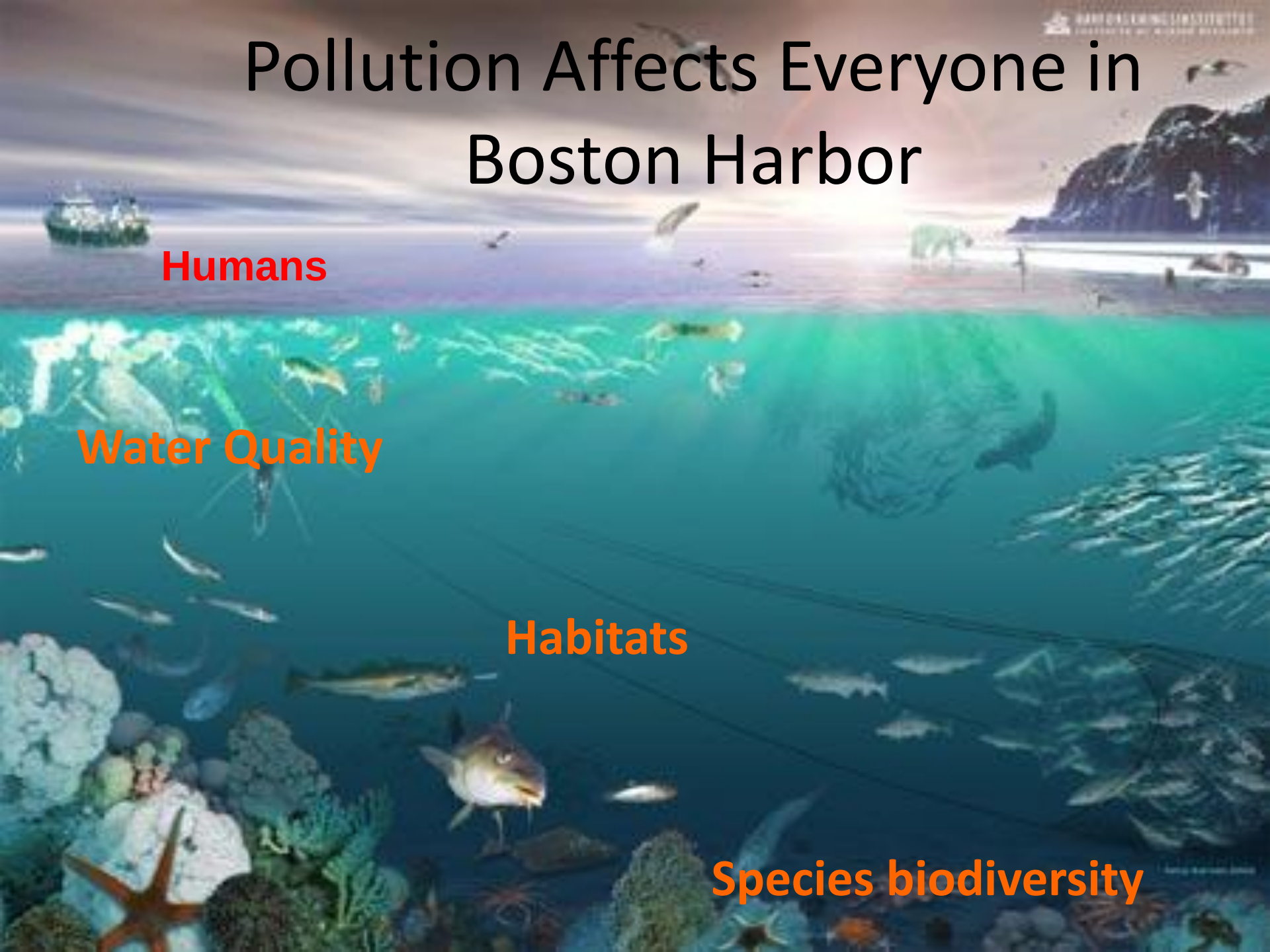




How much does it cost to dump? And how much to clean it up?

Would better enforcement and fines help change our behavior? OR do we need better education and outreach efforts?

Pollution Affects Everyone in Boston Harbor



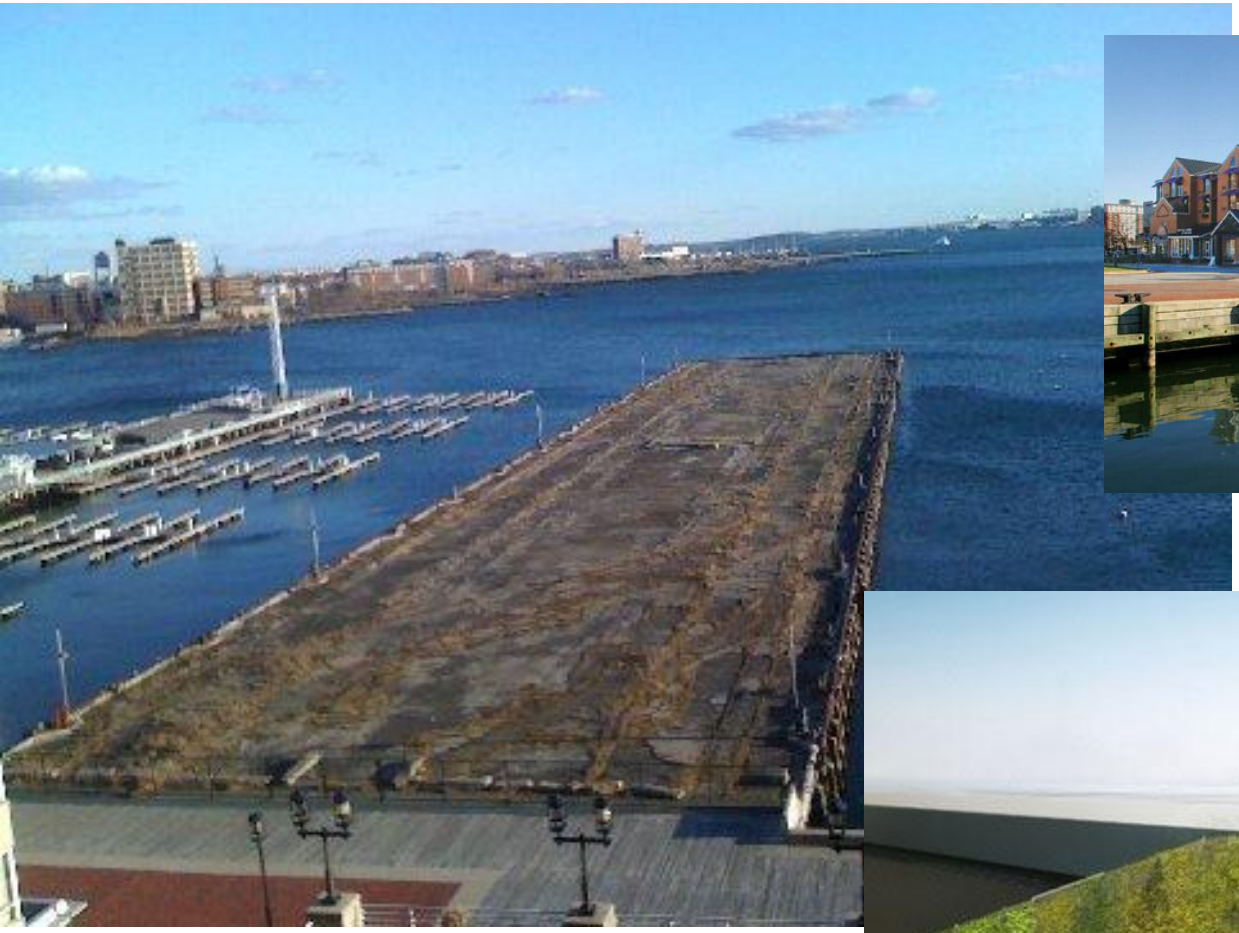
Students' Projects Here and Now in Your Neighborhood

- www.gbh.umb.edu
- http://faculty.umb.edu/anamarija.frankic/eeos476/eeos476home.html
- The Fairmount-Indigo Corridor Campus Initiative (FICCI)
- "Adopt' a Student for a Green Job

Green Future for Urban Harbors?

www.ny.curbed.com
GRO Architects

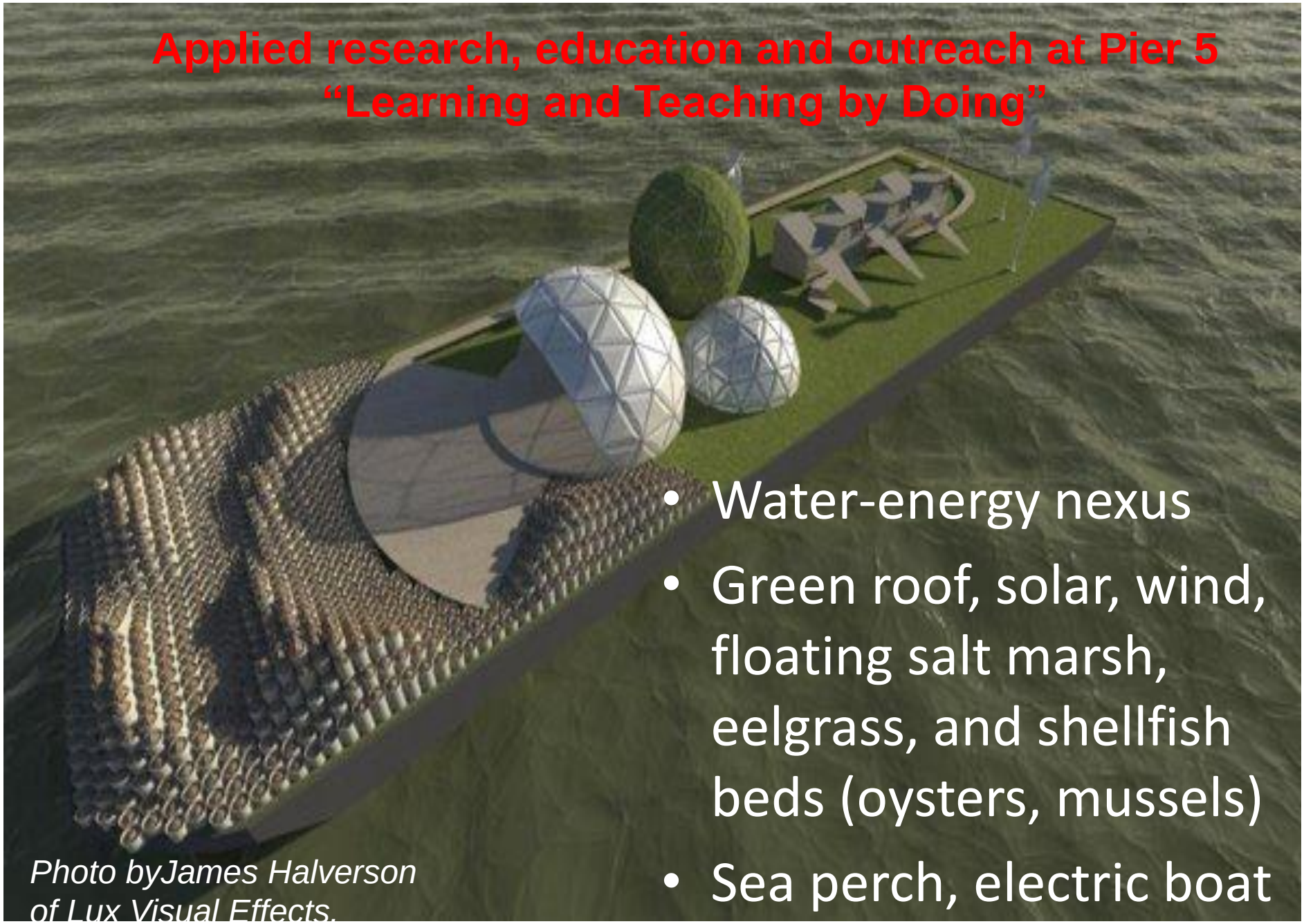
Pier 5 Vision?



OR

http://ny.curbed.com/tags/pier-15

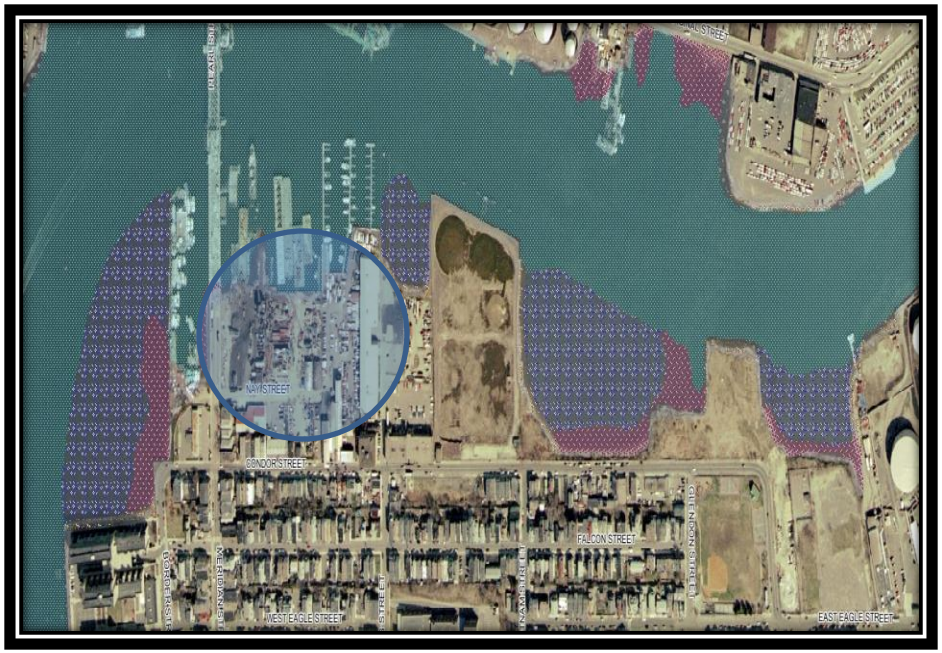
Applied research, education and outreach at Pier 5
"Learning and Teaching by Doing"



- Water-energy nexus
- Green roof, solar, wind, floating salt marsh, eelgrass, and shellfish beds (oysters, mussels)
- Sea perch, electric boat

Photo byJames Halverson of Lux Visual Effects.

There are many ‘Pier 5’s!



- What are potential solutions for degraded environments and our future challenges?
- Solutions exist for all environmental problems!

Ask Nature!

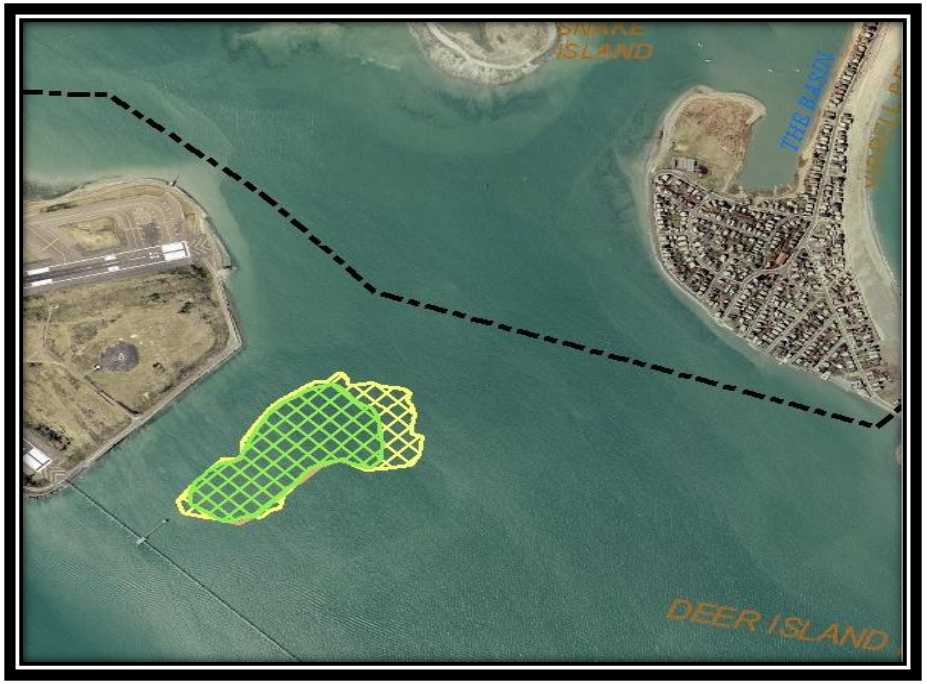
Condor St: ‘Urban Wild’ example on land - what’s missing on the water?

- Salt marsh
- Eelgrasses (SAV)
- Oysters and shellfish beds
- Research and education?

Connecting the areas of coastal Boston by creating **Green Piers Park as part of the Harborwalk**

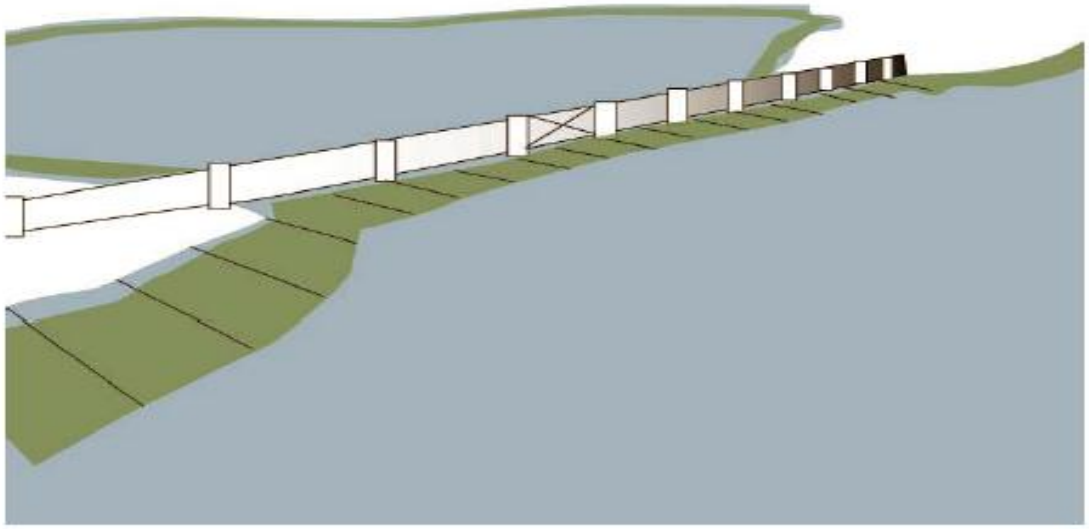
- Salt Marsh, SAV, and shellfish as part of Urban Wild
- Green roofs with solar panels
- SSO and CSO with UV filters

Logan Airport Site



- Bringing back Eelgrass, Oyster Reef beds, and Salt marshes – once upon time they were all part of the Boston Harbor;

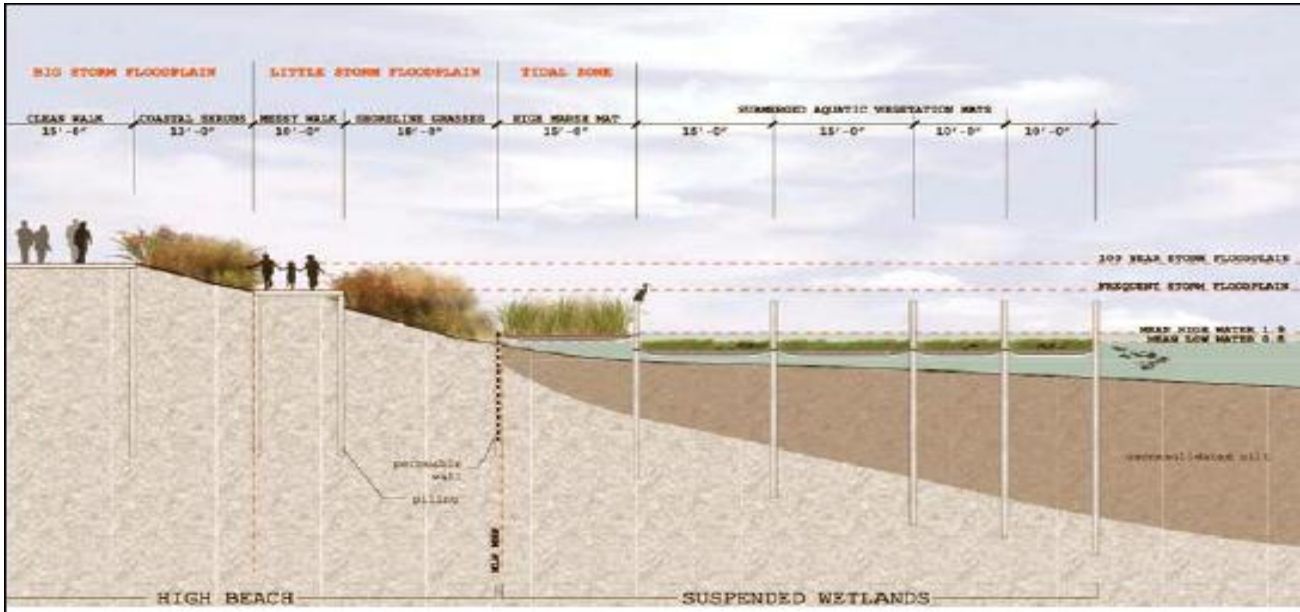
- www.bostonnatural.org and Urban Wild



A proposed "skirt" of submerged floating SAV beds attached to barrier and shoreline.

Our harbors consist of hard structures but it has been proved that we should include coastal "soft structures' in order to restore environmental quality, human health and safety., and become part of the coastal nature we depend on.

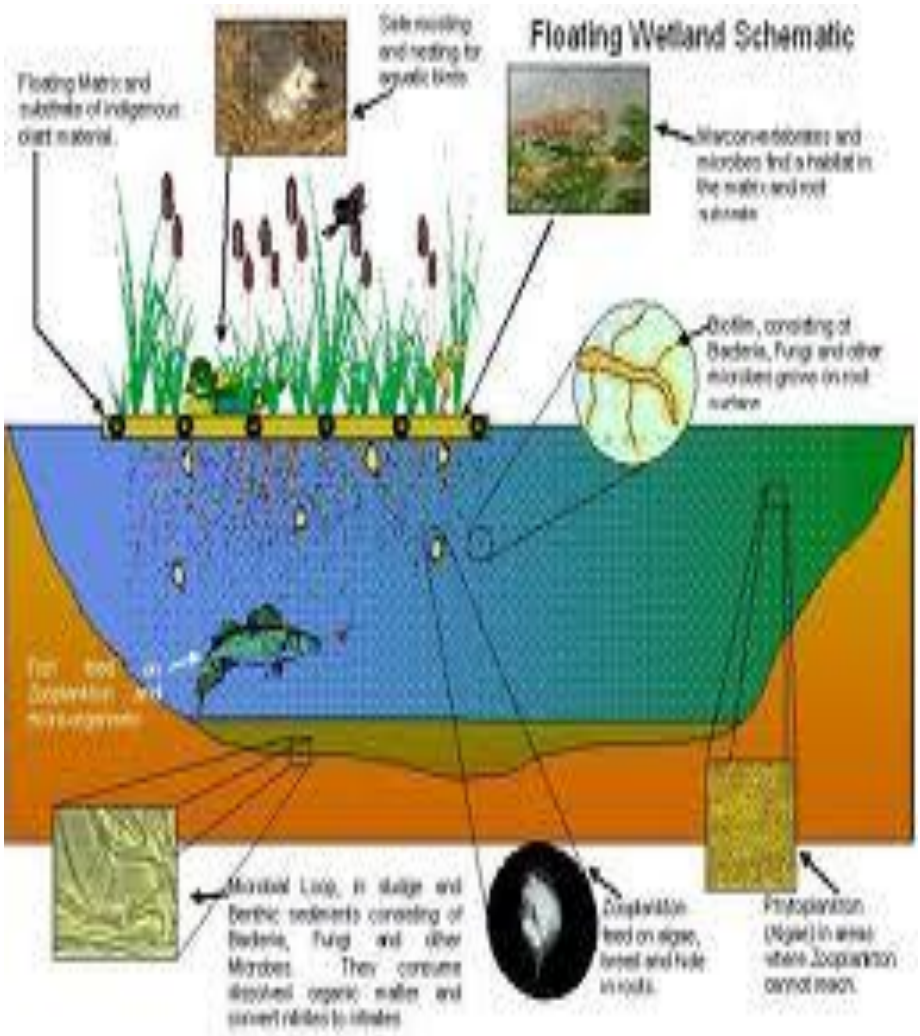
floating salt marshes, eelgrasses and shellfish would improve water quality, health and biodiversity , while protecting from erosion, storms and sea level rise;



New or re-used pilings as framework for floating inter-tidal and sub-tidal wetlands along dynamic shorelines subject to storm surges and rising sea levels. Proposed for section of former industrial shoreline, Chesapeake Bay watershed.

K. Hill and DIRT Studio, 2008.

Floating wetlands



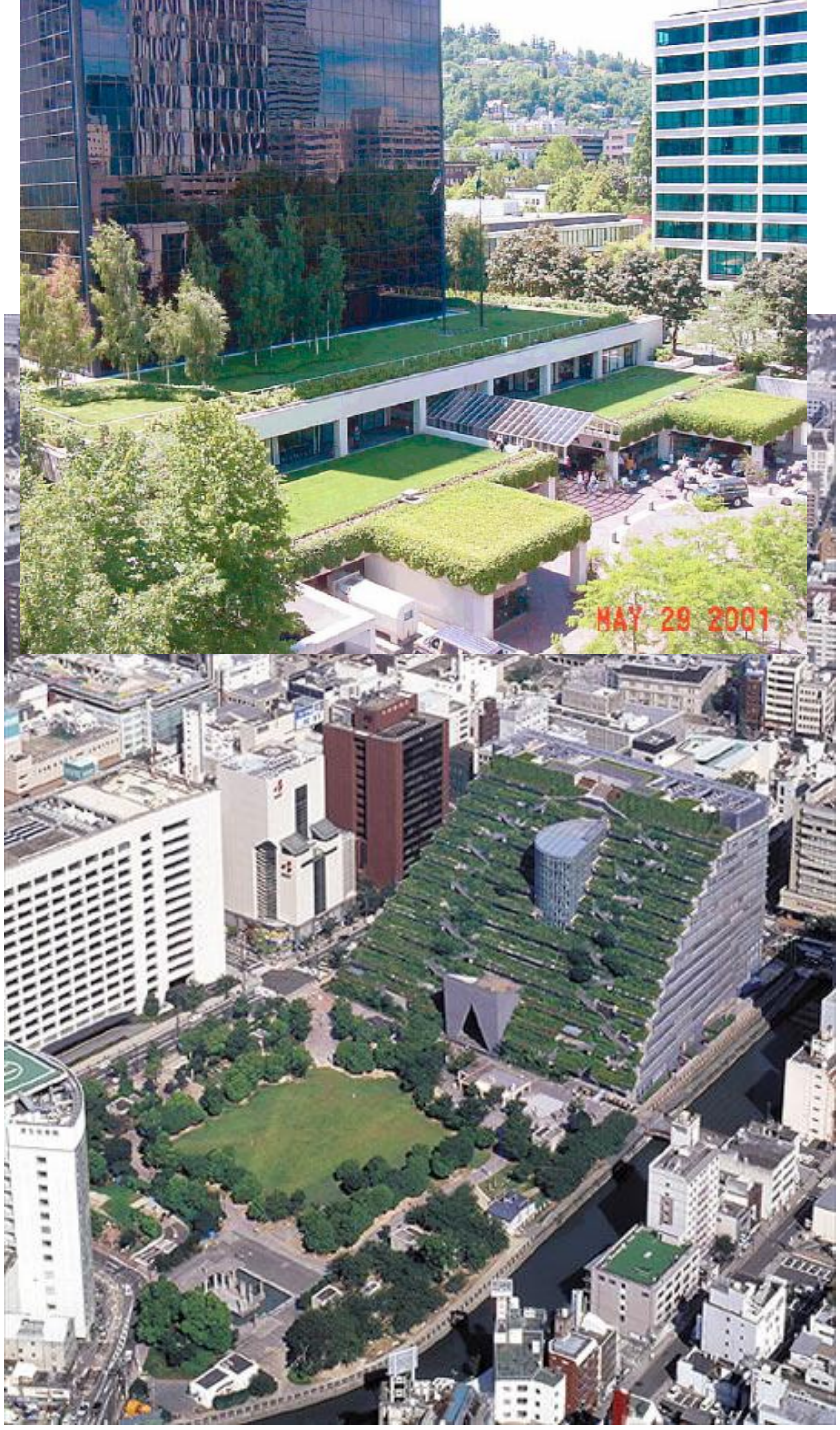
Green Roof Systems

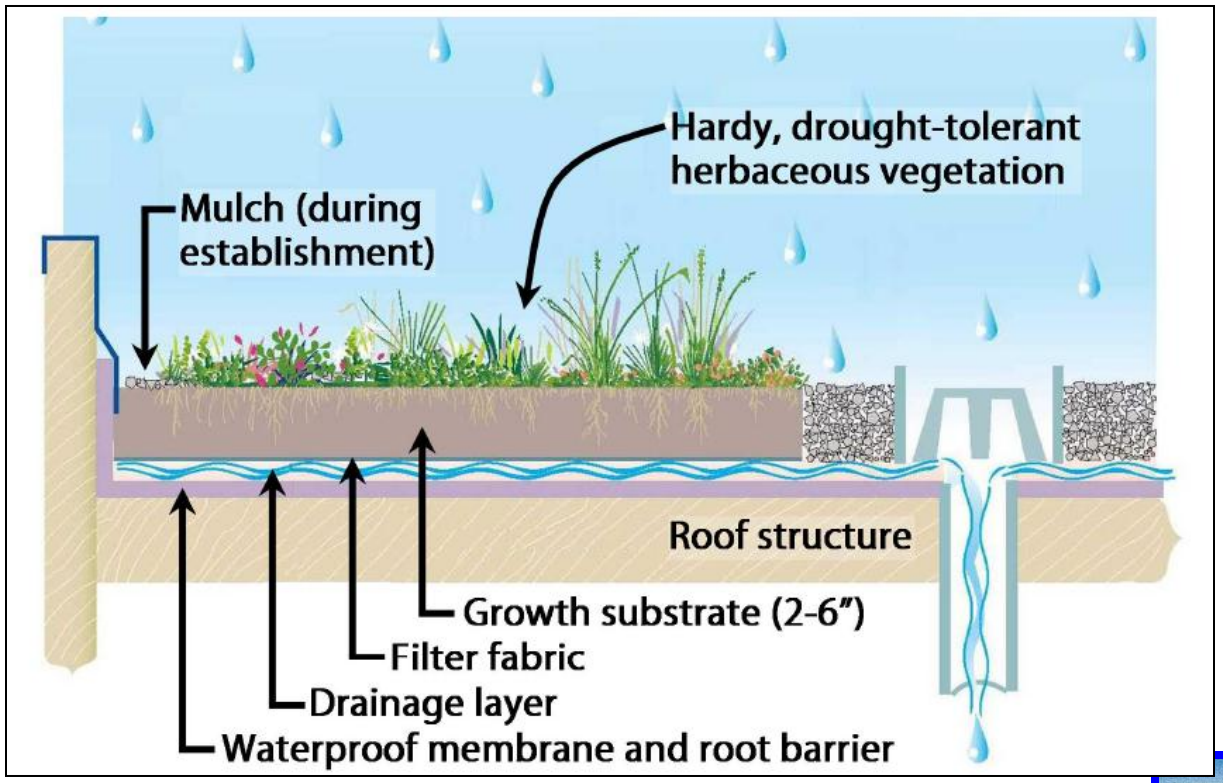
Runoff Reduction, Reduced Heating / Cooling Costs

- Rainwater stored in a lightweight engineered soil medium
- Hardy, drought-resistant vegetation
- Reduces runoff by 50%

Not recommended in watersheds where baseflows are already diminished. Consider direct recharge of roof runoff to enhance recharge.

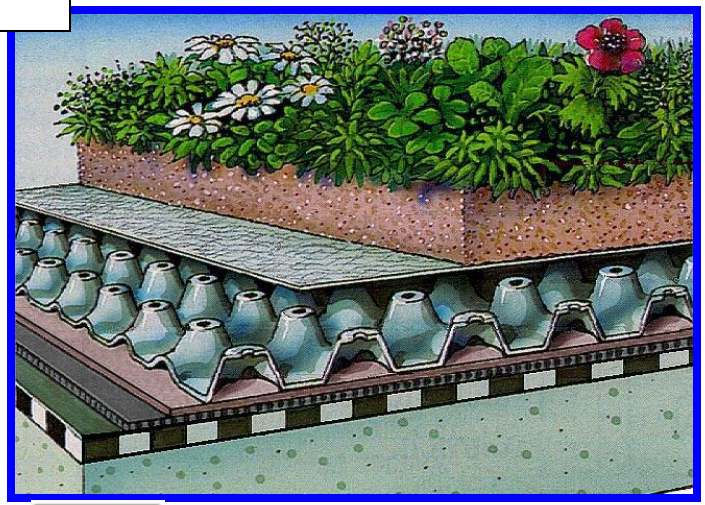
www.smartgrowth.gov





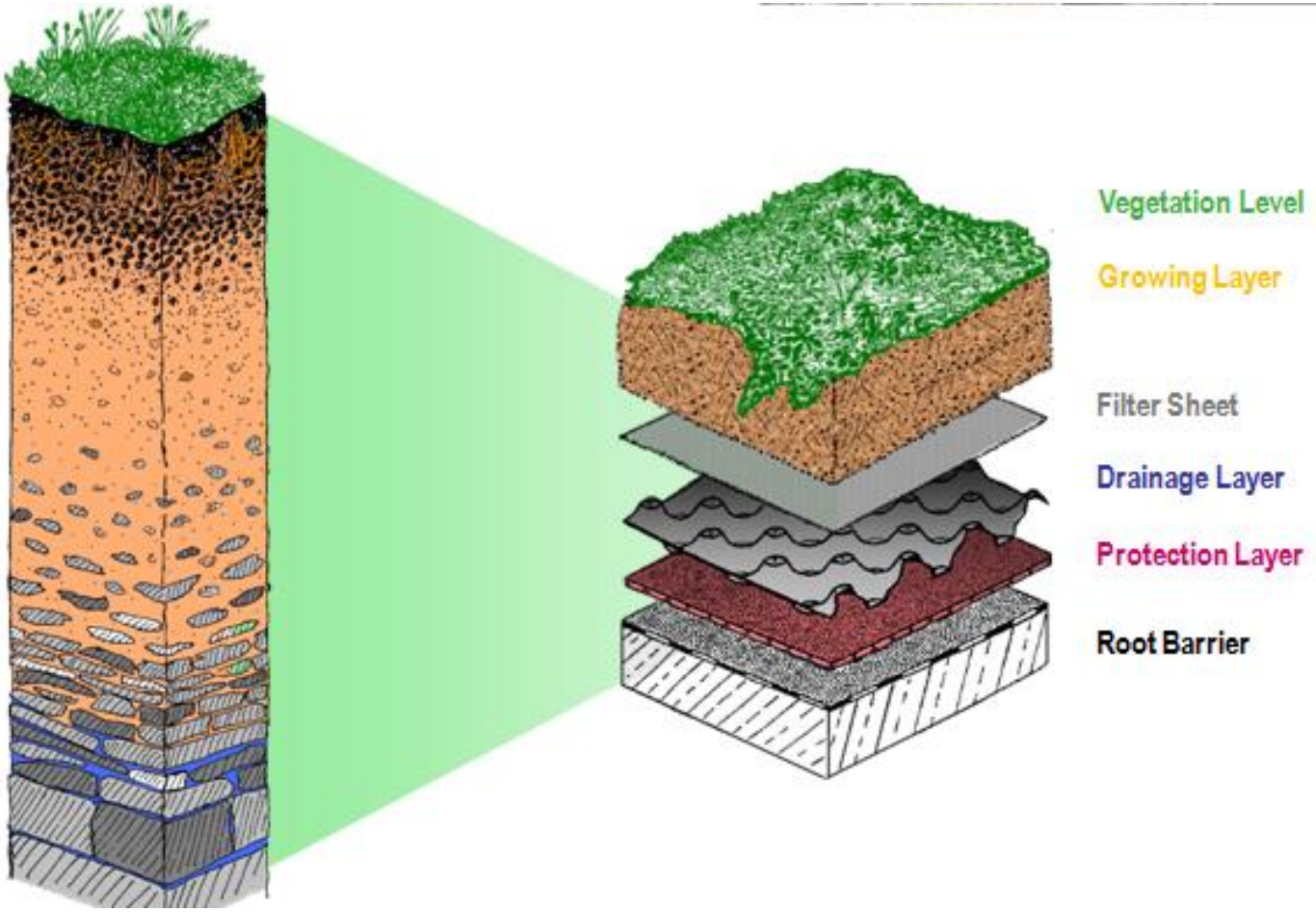
How does it work?

Extensive Green Roof



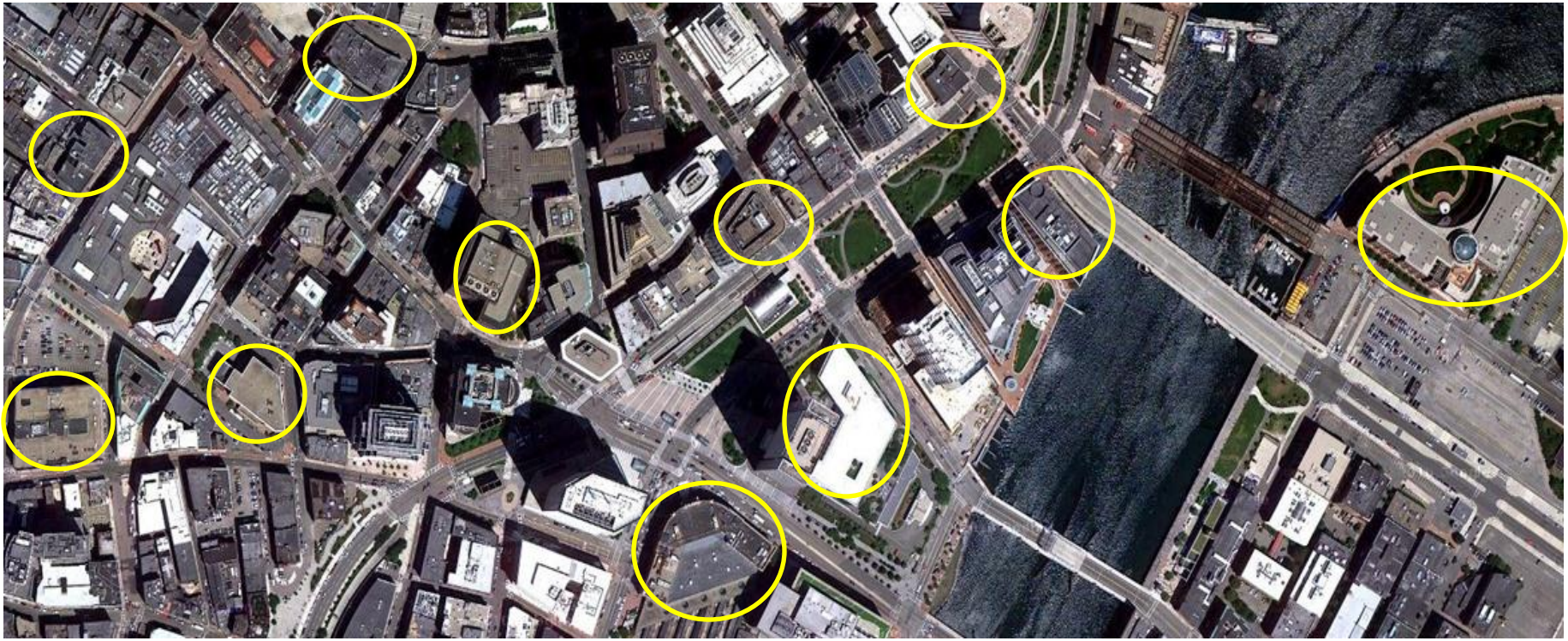
www.zinco-usa.com

System Build-Up BioMimics Nature



www.zinco-usa.com

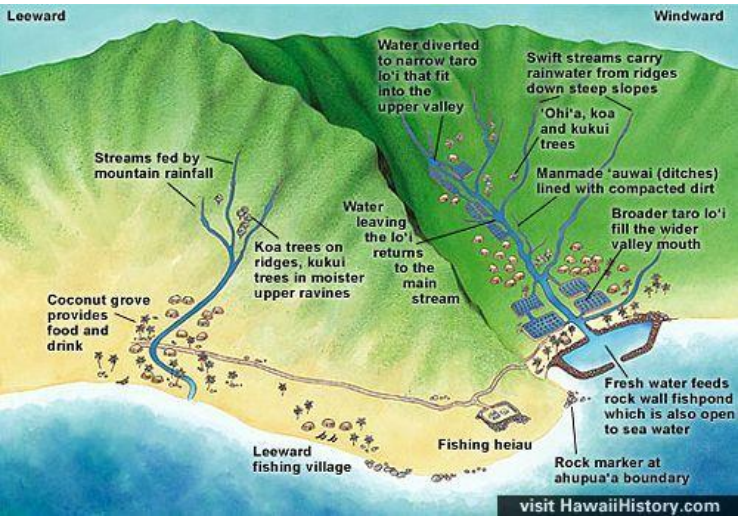
Abundance of Flat Roofs (DOWNTOWN BOSTON)



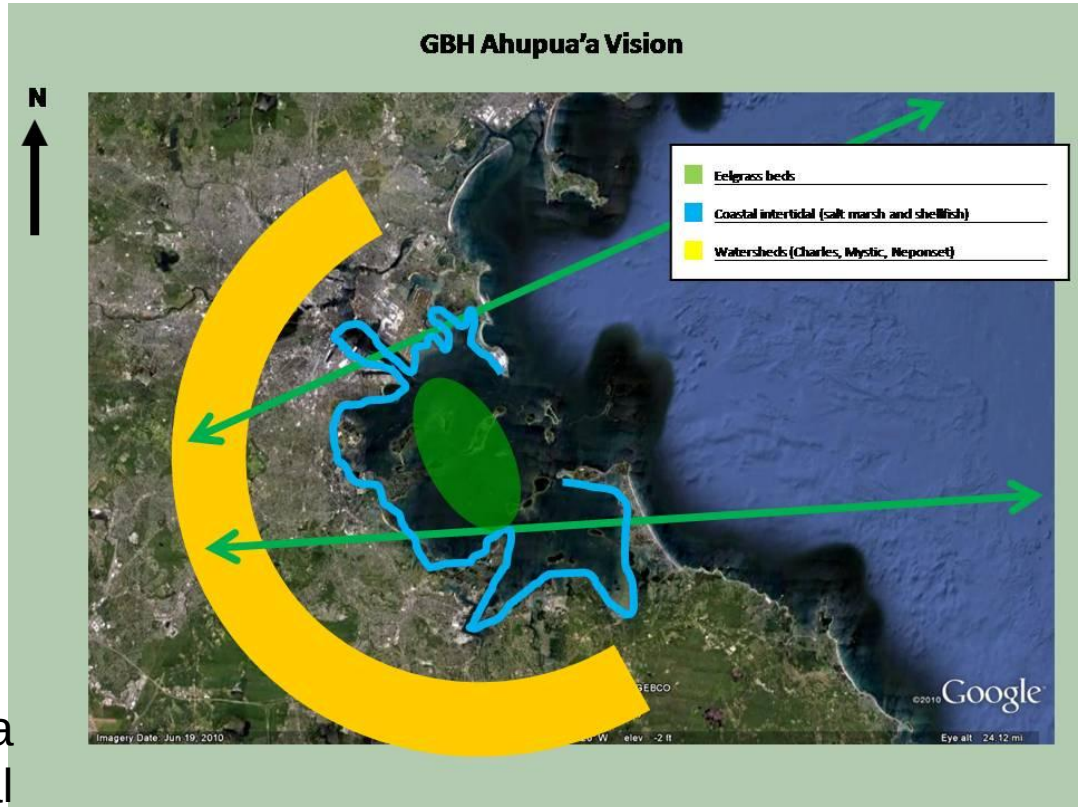
Google maps 2010

Imagine ‘green’ instead of ‘black’ roofs!
Creating green corridors on the city’s roofs and along the city’s shores.

http://oceanworld.tamu.edu/resources/oceanography-book/Images/ahupuaa.jpg



Ahupua'a Vision for Boston Harbor



1. Yellow - watersheds – Neponset, Charles, Mystic; focus on green roofs and other pervious surfaces, and water-energy nexus in order to restore the watersheds self-sustainability;
2. Blue - Urban coastal intertidal area a) includes the Harbor walk (potential sites for restoring native species of shellfish, e.g. oysters, mussels); b)salt marsh; c) tidal mud flats with soft shell clam; and d) eelgrass beds;

3. Green- Boston Harbor Islands intertidal and tidal areas with similar key coastal habitat restoration activities.
(Source: Frankic and Greber, 2010)

Many coastal cities already have green futuristic visions: New York, Chicago, Rio, Copenhagen, London, Hamburg, etc

www.worldchanging.com

"The effects of climate change and sea-level rise on coastal cities inspired the exhibition, **Rising Currents**, at New York City's Museum of Modern Art. Working in collaboration with the P.S. 1 Contemporary Art Center, five teams of architects and landscape designers were asked to envision projects for New York City's future coastline. The plans all create what they call "soft" infrastructures — landscapes that will allow rising sea levels to flow within and around the building sites where power, water, sewer, and gas lines are encased in waterproof vaults beneath the sidewalks. "

www.worldchanging.com

http://www.worldchanging.com/archives/011095.html

- **How long does it take to apply nature's wisdom that adapted and evolved for millions of years despite changes in the sea level, temp, pH, CO_2, etc.?**
- **Surrounding our selves with smart nature's solutions would provide a cost-effective storm-water management, as well as revitalize the harbor's biodiversity, health and resiliency. We have conceived new shellfish habitats, as well as 'islands' of constructed coastal habitats to minimize the effects of storm surges, inundations, erosions. We just need to apply what nature knows the best. (A. Frankić)**

www.gbh.umb.edu