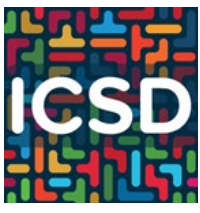


BLUEBLOCK GARDEN

A Floating Habitat for Blue Carbon Initiative



RETI
center

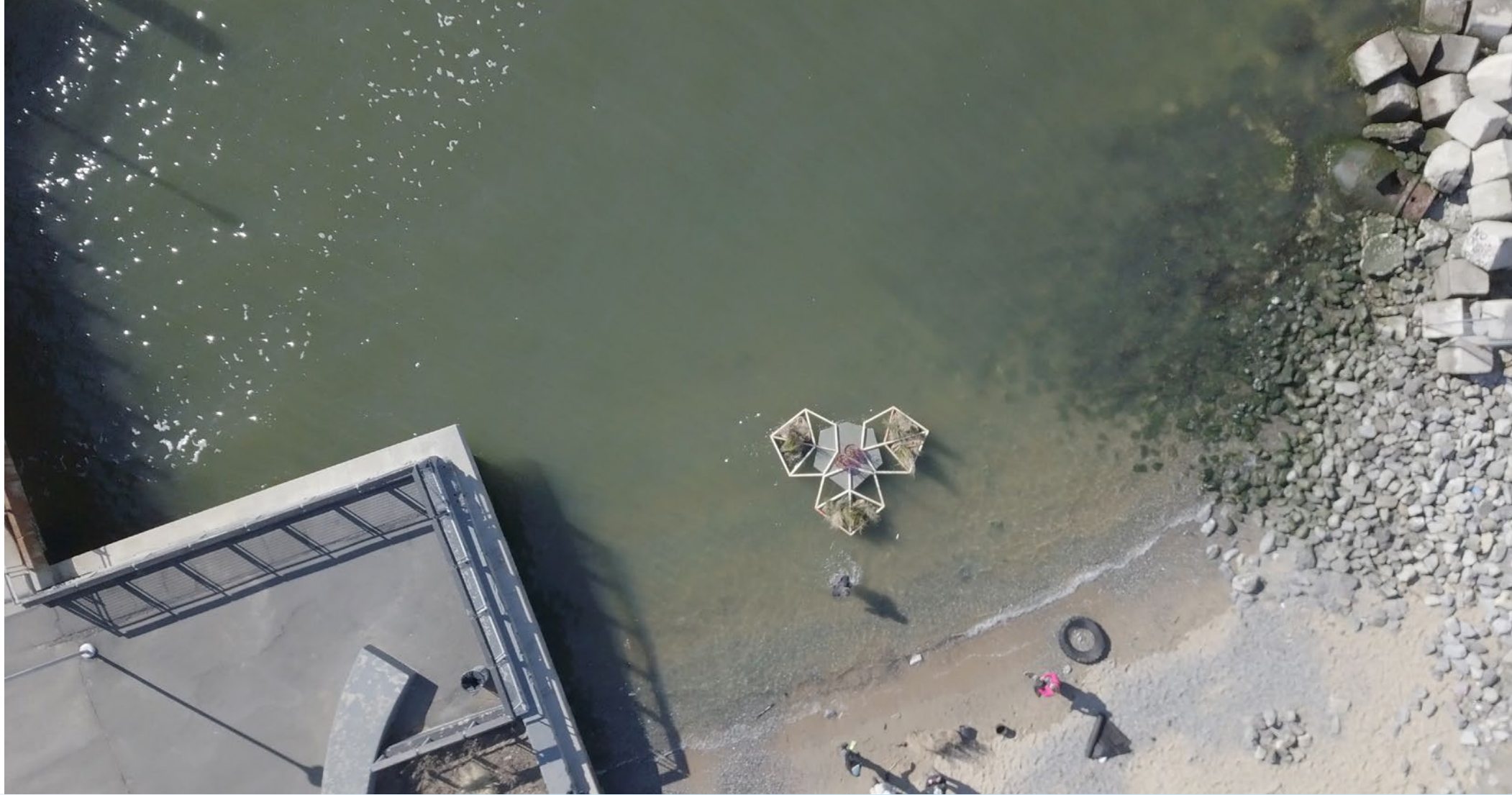
thread
collective

sustainable landscape architecture urban design
www.threadcollective.com

The Resilience Education, Training and Innovation Center (RETI) weaves together businesses, workforce and community development organizations, and educational institutions to drive innovation and job creation in urban climate resilience and sustainability in New York City and beyond. In doing so, it addresses the socioeconomic inequality challenges that low-income coastal communities can face through job training, placement, and improved local infrastructure.



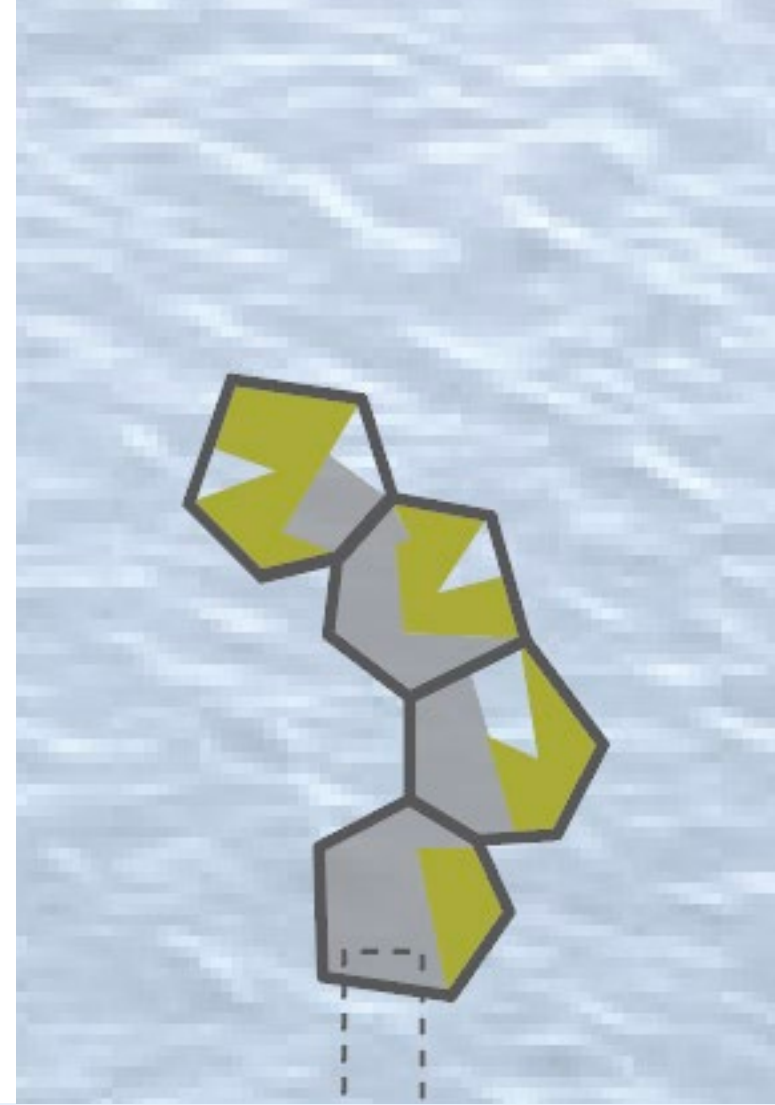
thread collective explores the seams between building, city, and the environment, stitching together these diverse elements through innovative design and research.



drone shot of Pilot 1, Red Hook Beach, Valentino Pier Park Red Hook Brooklyn NY



Pilot 2 preparing to launch at GBX Terminal, Gowanus Bay NYC Harbor



plan

BACKGROUND BlueBlock Gardens create small salt marsh archipelagos that provide a range of ecological benefits for humans and other species: they increase habitat for a broad range of marine life, introduce plant ecologies at engineered urban edges, improve water quality, and serve as platforms for hands-on high school science. The constructed landscapes are designed specifically for urban coastal conditions and communities, linking positive ecological impacts and sustainable production practices, jobs, and education. We are in the process of building and installing a series of prototypes, following our first successful floating pilot in March of this year. In addition to accessible docks and planting areas, we are currently exploring how every level of the floating garden can be calibrated to actively support life, with specific focus on the underwater-scapes.

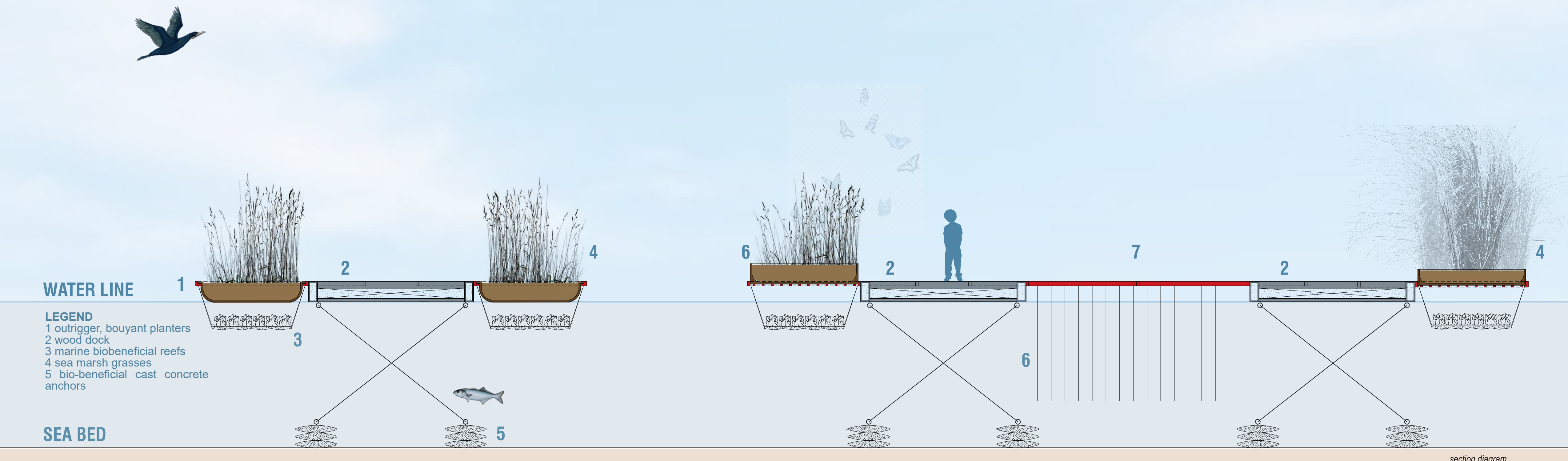
The design of the BlueBlocks Garden is multi-layered, mimicking an integrated ecological system that supports life along a deep sectional column. Elements being developed for the underwater-scape include: biophilic concrete as the anchor on the seafloor and as undulations and indentations integrated into the underside of the garden flotation ring to facilitate sub-aquatic growth; mussel single-drop stocking for varied marine life; and planted beds suspended in and above the water, providing habitat for mammals, birds and insects. The biophilic concrete elements are being provided by collaborator Evelyn Tickle. Her proprietary concrete mix is formulated to match the oyster shell and provides early stage nutrition to a range of species, and has been tested and used widely to demonstrable success.

RESEARCH QUESTION How do we support the regeneration of aquatic habitats in urban contexts that are suffering from environmental degradation? How do we work on a timeline that allows for quick installations that can have great impact in a short period of time? What materials are best suited for a low-carbon footprint and allow for training and involvement by a wide audience?

HYPOTHESIS Creating man-made habitats that closely mimic natural systems will help foster ecological improvements in areas that are polluted and degraded. Such installations can also act as places for enhancing the blue economy around sustainable agricultural harvesting (seaweed, muscles, fish) and provide training platforms for those with little access to coastal ecologies.

METHODOLOGY Iterations, testing, and metrics. Over the past 2 years the BlueBlocks have gone through a number of design options, exploring materials, forms and shapes and will continue to do so over the next 2 years. The New York City Harbor has a unique set of marine conditions to address and such testing is critical to ensuring proof of concept.

This project has been conducted in three phases - design, prototyping / fabrication, educational outreach + launching. With each cycle going through several iterations. We have worked closely with academic partners and community partners, to ensure that students are participating to allow for the learning of principles and practices of design, fabrication, testing, and supporting scientific experiments.



The floating gardens have been deployed in Red Hook, Brooklyn, on 13 acres of water at the GBX Terminal, privately owned water and uplands. RETI is collaboratively developing a resilience-focused curriculum for schools integrating science and resilience to advance their core educational mission addressing climate and especially water issues. The Floating Gardens are a hands-on extension to RETI's Resilience Curriculum, helping students, from highschool to PhD candidates, learn about water pollution and solutions by understanding, creating, and experimenting with bio-beneficial habitats

REBUILDING OUR BLUE ECONOMY

Oceans already support millions of jobs, underpin our food system and contribute \$304 billion to our national GDP. They also have the potential to be one of our strongest tools in the fight against climate change. Three billion people around the world depend on wild-caught and farmed seafood as a major source of protein. Yet decades of overfishing, pollution, and climate impacts have pushed our oceans to the brink of collapse. We know that we can have a highly productive ocean. In fact, ocean-related jobs have grown at three times the rate of the national average. It's time to restore our oceans and harness the potential of the Blue Economy.

- PROJECT OBJECTIVES**
- + Develop a modular floating garden system that can be adapted for multiple sites and uses
 - + Think creatively about the entire process of production, manufacturing and design to support ecological goals: employ recycled and everyday materials where possible, design / fabricate all surfaces to create habitat, ask what else can it do of each component
 - + Provide training and permanent jobs in future-facing industries such as renewable and efficient energy, carbon neutral manufacturing, and climate change protection measures for disadvantaged populations
 - + Increase salt marsh habitat at hard urban edges
 - + Design elements for wave attenuation
 - + Create space for emerging aquaculture businesses
 - + Use plants to filters toxins / excess nutrients, thus demonstrating strategies to improve water quality
 - + Work with young people to cultivate the mindset and motivation to cope with our changing environment



site of GBX Terminal Red Hook Brooklyn

LEGEND

- 1 salvaged wood sourced locally
- 2 natural coir for planters
- 3 seagrasses, *Spartina alterniflora*
- 4 planters for garden
- 5 GROWN Oyster Reels mockup
- 6 rope mussels will be installed in spring 2022
- 7 Billion Oyster Project baskets will be hung below
- 8 aquaculture of algae will be grown off the docks
- 9 Nia Rene studying marine life forms of the gardens

