



Katie Mosher, Restoration Director

Rockland County Water- September 19, 2017



@BillionOyster



BOP

- Overview of the Billion Oyster Project
- Education and Schools Program
- Restoration and Research
- Tappan Zee Bridge Project
- Volunteer Opportunities
- Funding and Partners



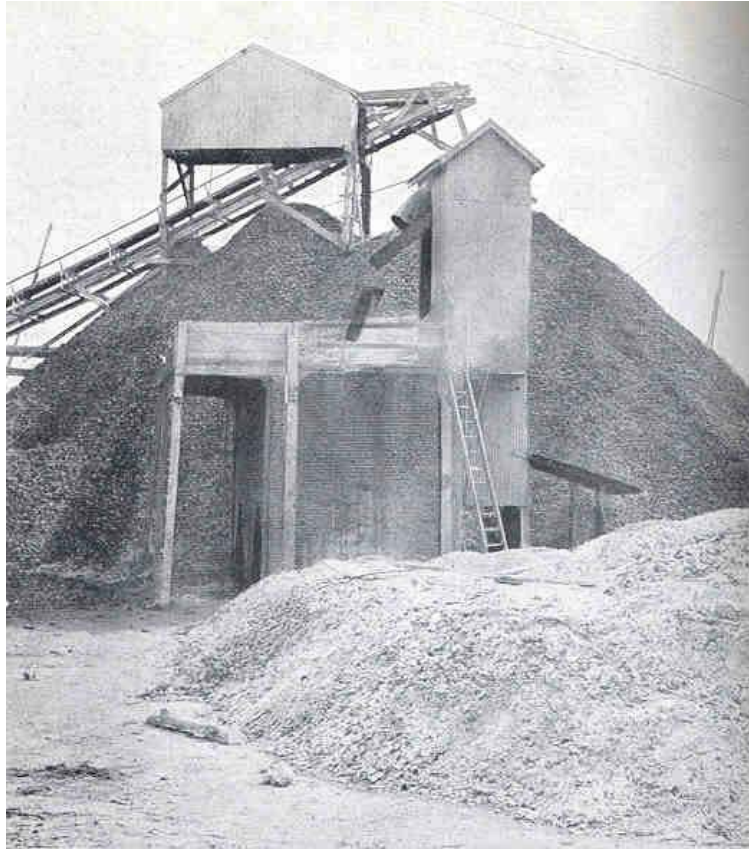
Reconnecting New Yorkers Back to Their Waterfront





Since the 1600s, we've lost 220,000 acres of oyster reefs and billions of individual oysters- possibly half the world's supply by some estimates- leaving a dramatically changed landscape and ecosystem. But New York lost more than just the oyster itself.

Dutch colonists burned oyster shells to make lime for building.

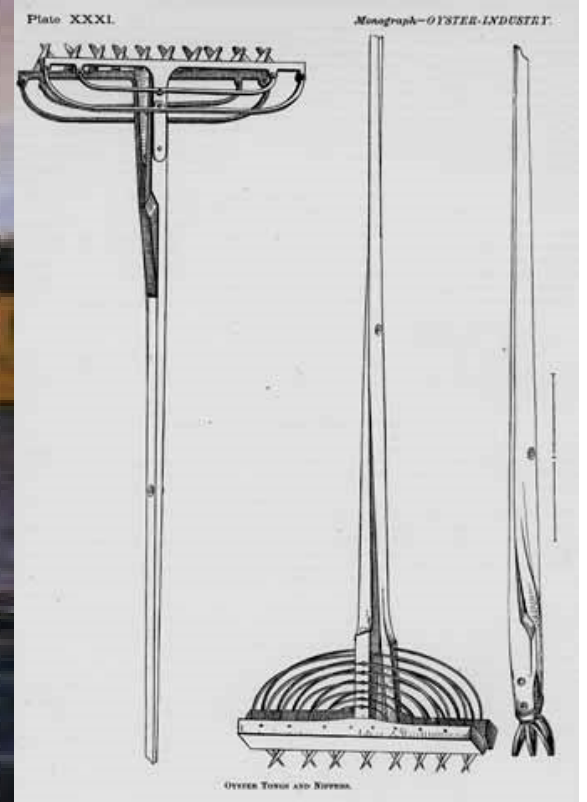


Weekday lunch dining culture for both workers and Wall Street





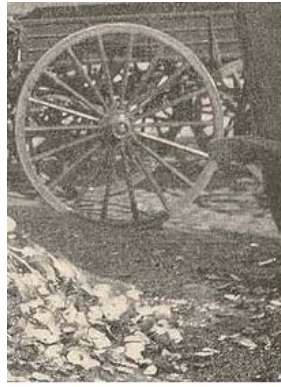
Oystermen harvested local oyster beds using oyster tongs





What happened?

- Overharvesting
- Dredging
- Pollution



Once local oyster beds were depleted (some as early as 1820), oystermen cultivated beds of oyster “seed” imported from further south (mostly the Chesapeake) to grow out in New York.





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Billion Oyster Project

Who We Are & What We Do



Habitat in Urban Estuaries... lots of challenges:

- Combined Sewer Overflows (CSOs)
- Legacy toxins
- Communities disconnected from the natural environment





New York Harbor School

Career & Technical Education Programs:

- Aquaculture
- Professional Diving
- Marine Systems Technology
- Vessel Operations
- Ocean Engineering
- Marine Biology Research
- Marine Policy







Billion Oyster Project

Education restoration project working to plant one billion oysters to New York Harbor by 2035



70 Restaurants in the Shell Collection Program: 700,650 lbs collected to date



Aquaculture Hatchery

Produce and maintain oyster stock for restoration research

1 Collect and spawn local oysters

2 Import larvae



Volunteers of all ages!



Community Organizations





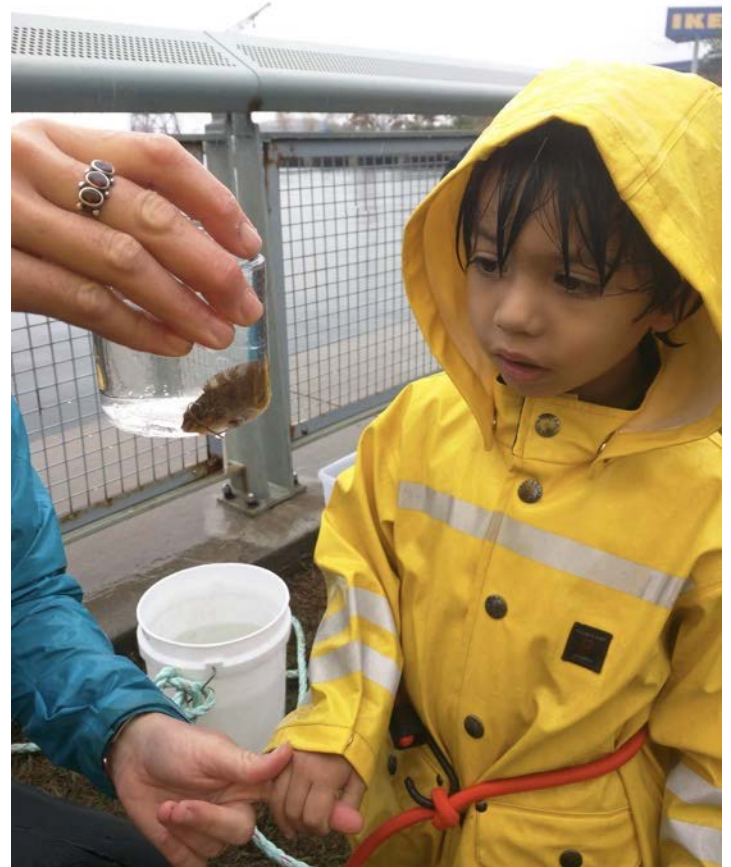
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Billion Oyster Project

Habitat restoration without public education is fleeting.



Elementary, Middle & High School Students and NYC Teachers



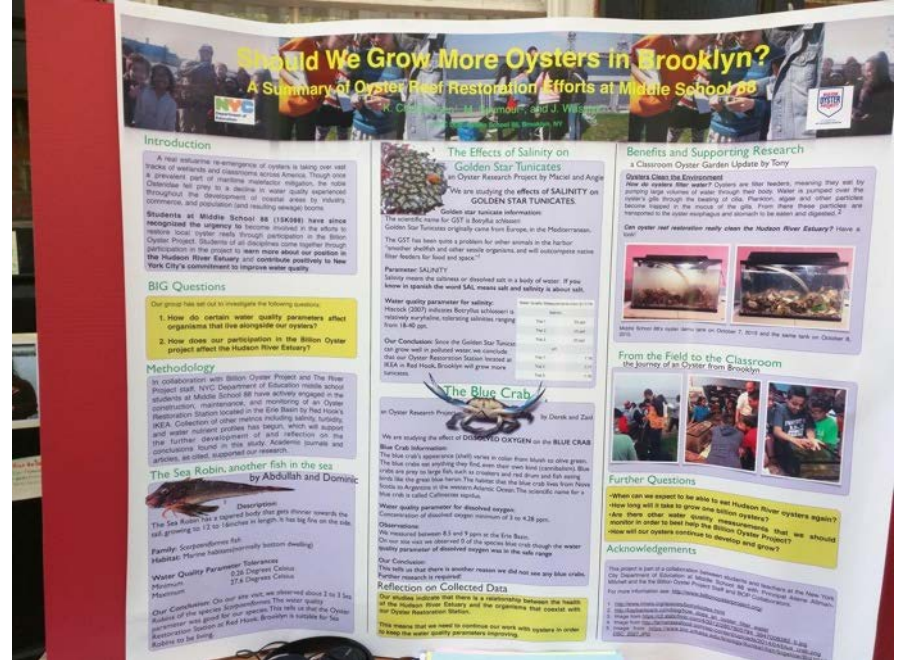


Students Collect Their Own Data

- Urban fieldwork brings an added layer of complexity.
- Allows a wider breadth of engagement to students from diverse backgrounds.



Annual BOP Symposium



Oyster Research Stations (ORS)

- À la carte protocol training
- Protocols are applicable outside of the NY Harbor
- Model supports needs for research and needs of teachers to have curriculum





The BOP Platform

Events

Search for an Event by name, description, skills taught...

Show All Type Date: Upcoming events

ORS Basic Training	Scientist Workshop	Professional Development	ORS Basic Training
Oyster Research Station (ORS) Basic Training Sep 25 2017 MONDAY 6:00am-1:00pm 134 Carder Rd, New York, NY 10004, USA Registration is closed	Nutrient Cycling - Professor Chester Zarnoch Oct 3 2017 TUESDAY 2:15pm-4:30pm 1 Pace Plaza w210, New York, NY 10038, USA Event is full Registration is closed	Build Your Classroom Library! Oct 10 2017 TUESDAY 1:45pm-4:00pm 23 spots 22 days left to register	Oyster Research Station (ORS) Basic Training Oct 13 2017 FRIDAY 6:00am-1:00pm 134 Carder Rd, New York, NY 10004, USA 8 spots 13 days left to register
Professional Development	Advanced Field Training	Professional Development	Scientist Workshop
Set up a Classroom Oyster Tank Oct 24 2017 TUESDAY 1:45pm-4:00pm 3 Spruce St, New York, NY 10038, USA	Oyster Research Station (ORS) Advanced Training Nov 6 2017 MONDAY 6:00am-1:00pm 134 Carder Rd, New York, NY 10038, USA	Where is my ORS site? Oct 17 2017 TUESDAY 1:45pm-4:00pm 3 Spruce St, New York, NY 10038, USA	Marine Genomics - Professor Elizabeth Alter Nov 14 2017 TUESDAY 2:15pm-4:30pm 1 Pace Plaza w210, New York, NY 10038, USA



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Restoration
Program



Organizational Partnerships



Dr. Michael McCann

Urban Marine Ecologist

Collaborative work developing:

- Research goals
- User friendly monitoring protocols
- Data analysis
- Adaptive Management strategies
- Scientific engagement with community partners

Restoration Research Projects

The Head of Bay Oyster Pilot Project is collaboration lead by the New York City Department of Environmental Protection in Jamaica Bay.

- four reefs (~10 x 50 meters) made from shell and porcelain
- hanging longline nursery with 40,000 adult oysters in 80 cages
- spat collectors throughout the vicinity for monitoring for oyster recruitment

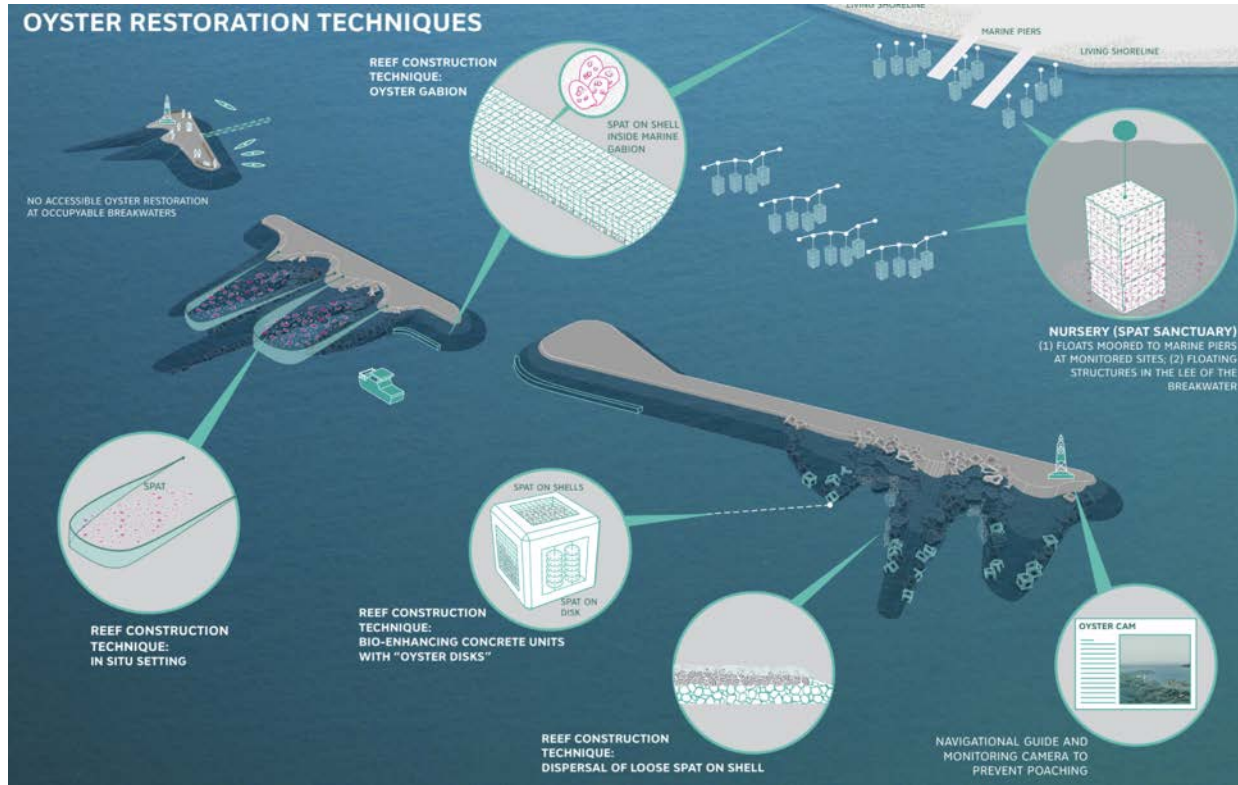


Restoration Research Projects



The Living Breakwater Project is a project of the Governors Office of Storm Recovery.

The breakwaters will be built off the shore of Staten Island beginning in 2020.

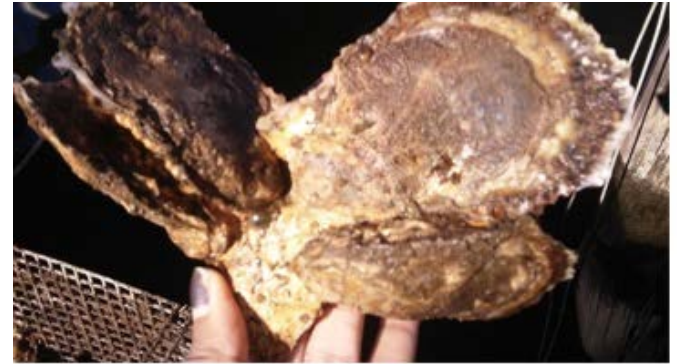


Challenges to Restoring Shellfish in Urban Areas



permitting

Oysters are making a comeback!





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NY Transit Authority

Led by AKRF, Inc.

Oyster Restoration Workgroup

Research:

Hudson River Foundation

Dr. Ray Grizzle

University of NH



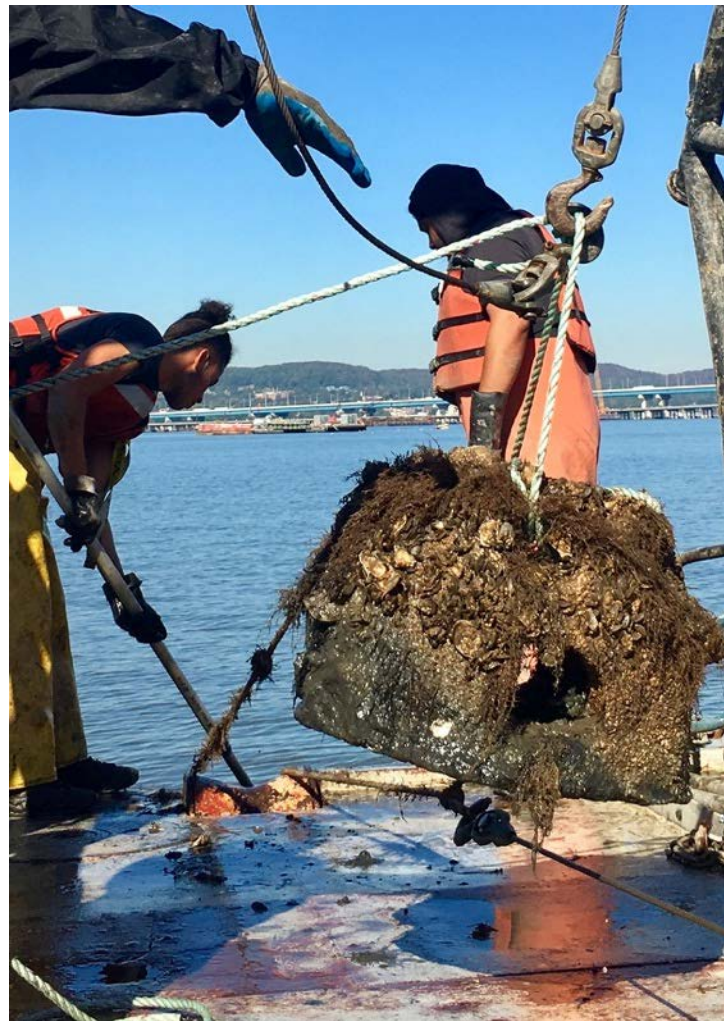
Phase 1: Oyster collection and placement (2013)

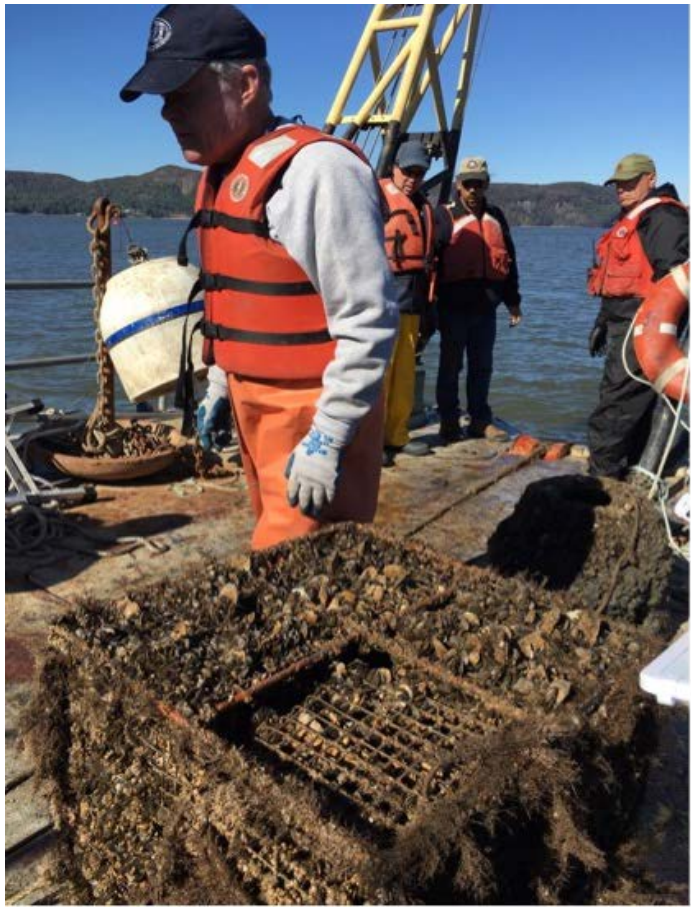
Phase 2: Spat collectors (2015)

Phase 3: Three potential restoration substrates at three potential restoration sites. The performance metrics included attracting (recruiting) oysters, supporting oyster growth and survival, and the longevity and sustainability of the three different substrates and construction techniques: 1) metal gabion cages containing oyster shells; 2) small Reef Balls ("Lo-Pro" style); and 3) larger Reef Balls ("mini-bay ball" style). (2015-17)

Phase 4: Fabrication and deployment of final substrate (2017-2018)







Common species on substrate:

- Bay barnacle (*Balanus improvisus*)
- Mussels including Hooked mussel (*Ischadium recurvum*).
- Hydroid
- Encrusting bryozoan *Membranipora* sp.
- Oysters

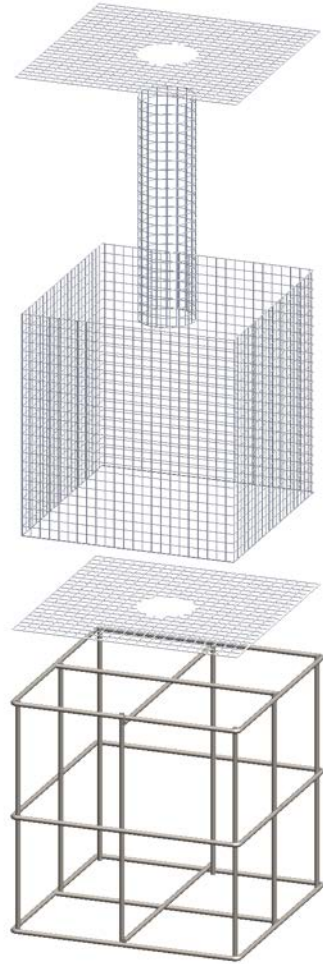
Successful recruitment and diversity of species





Next Step.. Fabricate 422 Gabion Cubes



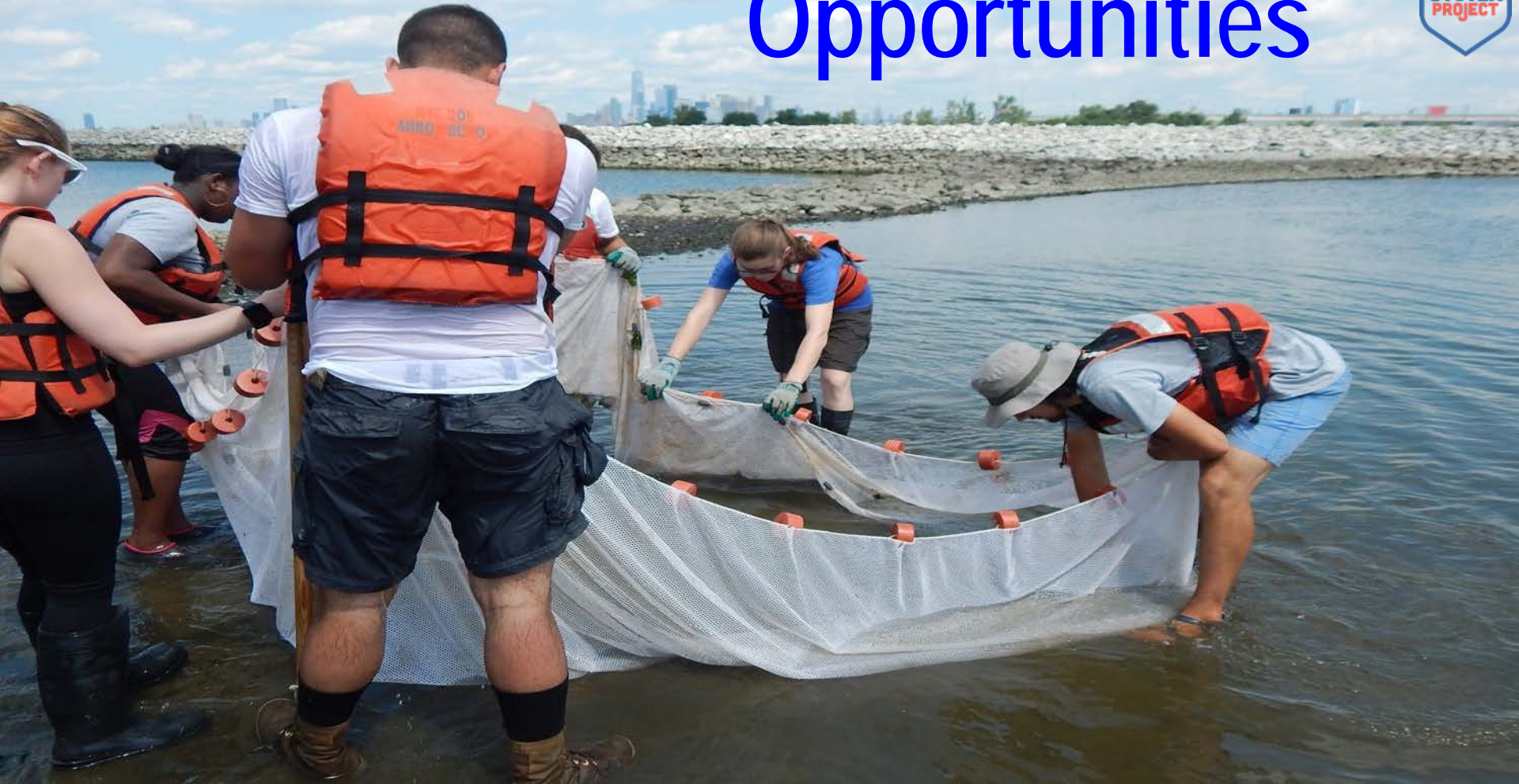




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Opportunities



Ways to get involved

- Volunteer
- Become a community scientist
- Join the BOP Schools program
- Donate
- Visit a BOP restaurant partner near you
- Join us for an oyster event
- Spread the word!



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In partnership with:

SIMONS
FOUNDATION

THE URBAN ASSEMBLY
**New York
HARBOR
SCHOOL**

The Nature
Conservancy

SUNSET
PARK

BROOKLYN BRIDGE
PARK

BROOKLYN BRIDGE
**PARK
CONSERVANCY**

DEPARTMENT OF ENVIRONMENTAL CONSERVATION
NEW YORK STATE

NYC
Department of
Education



**Center for
Family Life
in Sunset Park**

SCO Family of Services



NY AQUARIUM
Brooklyn Museum of Natural History

MUSCONGUS BAY
AQUACULTURE, INC.

**BROOKLYN
HISTORICAL
SOCIETY**



DEUS MEUS ET OMNIA
SFC
Est. 1859
BROOKLYN HEIGHTS, NEW YORK

Millennium
Development est. 1993

CityParks
Foundation

UPROSE

**BROOKLYN
CHILDREN'S
MUSEUM**
Since 1976



Thank You!

Any Questions?