



# DESIGNING FOR RESILIENCE ECOLOGY + ENGINEERING + ENGAGEMENT

Pippa Brashear  
SCAPE Landscape Architecture  
APRIL 23, 2018

+TAUTOG

+SCUP

+BLUE FISH

+STRIPED BASS

+AMERICAN LOBSTER









**GOWANUS LOWLANDS, BROOKLYN, NY**



**OHIO CREEK RESILIENCE PARK, NORFOLK, VA**



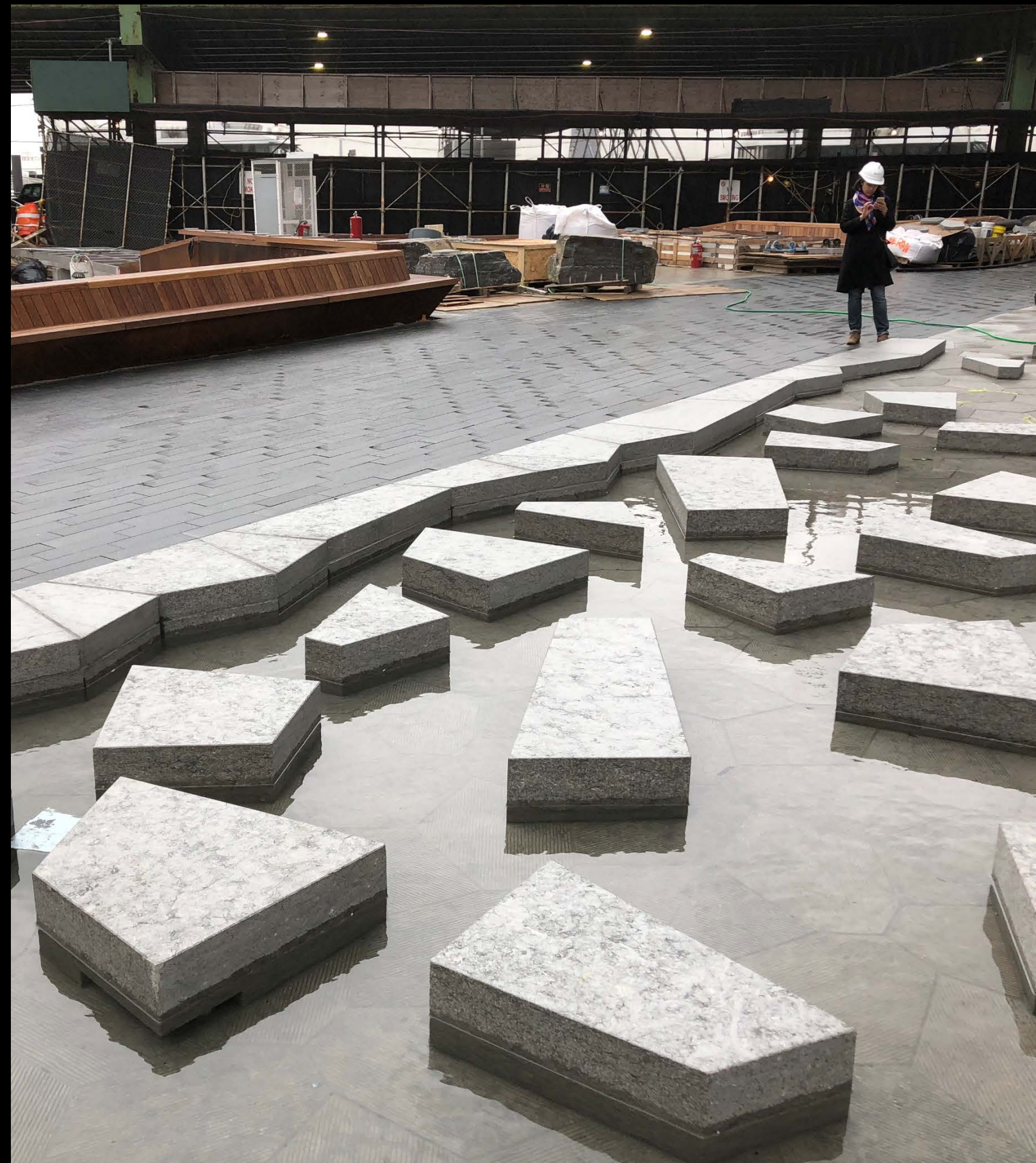


**NYP + COLUMBIA MEDICAL CENTER, NEW YORK,  
NY**



**COVE CO-HABITAT, LONG ISLAND, NY**







## Re•sil•ience

Resilience is the capacity of individuals, communities and systems to **survive** **adapt** and **thrive** in the face of stress and shocks and even **transform** when conditions require it.

# RECENT PROJECTS

...

NYC SPECIAL INITIATIVE FOR REBUILDING & **RESILIENCE**

NEW YORK RISING COMMUNITY RECONSTRUCTION PROGRAM

REBUILD BY DESIGN

COMPETITION NATIONAL DISASTER **RESILIENCE**

COMPETITION

REBUILD BY DESIGN - HUDSON

RIVER OHIO CREEK WATERSHED PROJECT, NORFOLK **RESILIENT** CITY

**RESILIENT** BY DESIGN BAY AREA  
CHALLENGE



2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022

**SUPERSTORM SANDY**  
OCTOBER 29/30, 2012

**SIRR (NYC)**

**NYRCR (NY)**

**RBD**

**NDRC**

**100 RC**

**RBD BAC**

**MOMA**

OCTOBER



**RISING CURRENTS**

MOMA



**PlaNYC**

**A STRONGER, MORE RESILIENT NEW YORK**

**REBUILD BY DESIGN**

**100 RESILIENT CITIES**

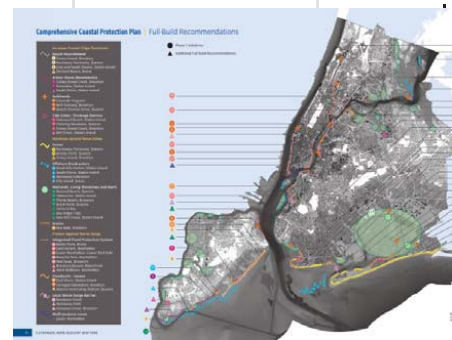


**National Disaster Resilience Competition**

**RESILIENT BY DESIGN**  
BAY AREA CHALLENGE



**RISING CURRENTS**



**SIRR**



**REBUILD BY DESIGN**



**NYRCR**



**RBD BAY AREA CHALLENGE**



Hurricane Sandy  
Rebuilding Task Force

# HURRICANE SANDY REBUILDING STRATEGY

*Stronger Communities, A Resilient Region*



August 2013

# REBUILD BY DESIGN

“Climate change is presenting unprecedented threats to communities across the country. Rebuild By Design is a model for how we can use public-private partnerships to spur innovation, protect our communities from the effects of climate change, and inspire action in cities across the world.”

—

Shaun Donovan

Chair of the Hurricane Sandy Rebuilding  
Task Force

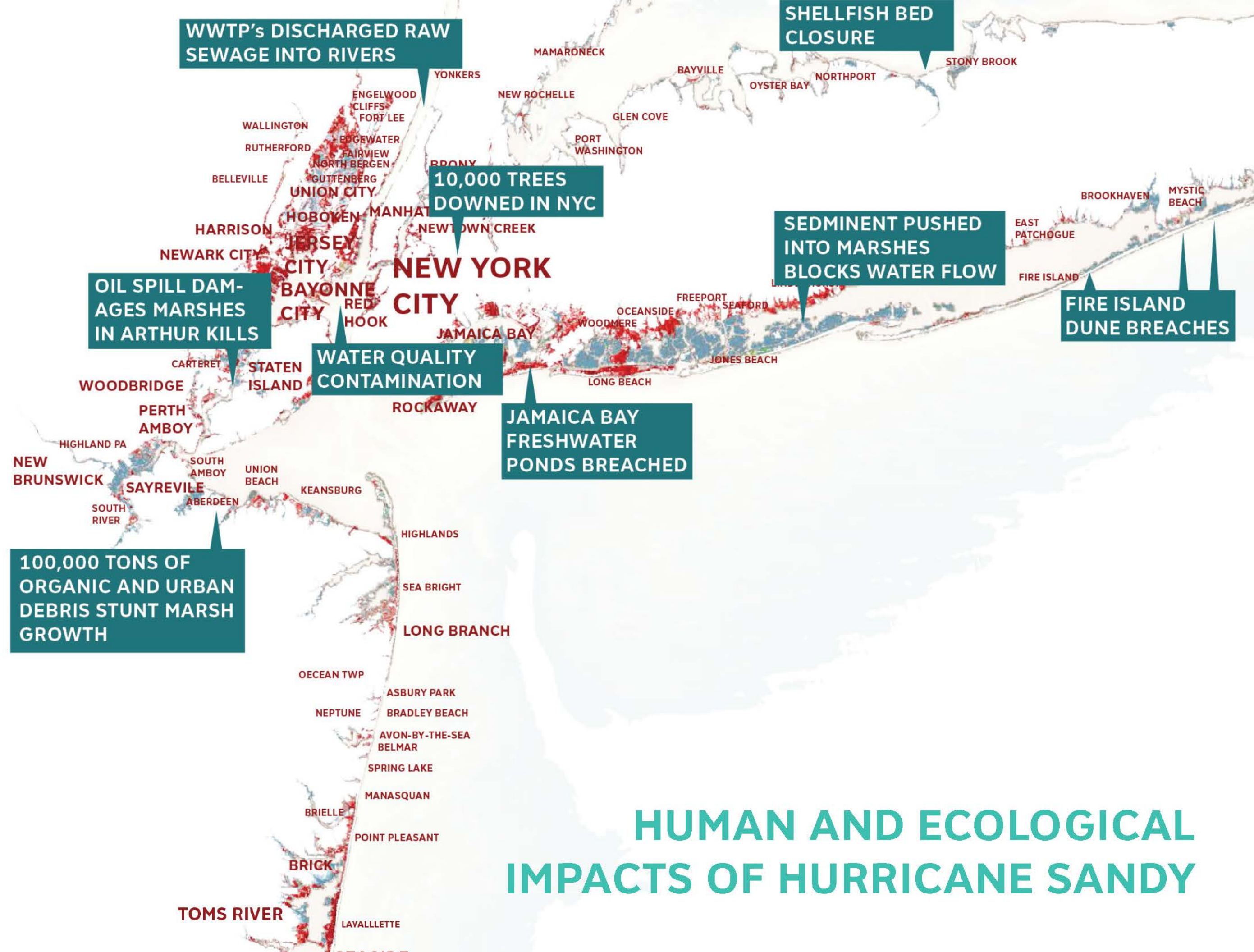
Secretary of the Department of Housing and  
Urban Development



**RBD was purposefully by design.  
Our detour around existing-but-failing frameworks was only possible through the power of design, which has an unrivaled capacity to unify.**

- Henk Ovink, TOO BIG, 2018





# HUMAN AND ECOLOGICAL IMPACTS OF HURRICANE SANDY



**\$ 22,800,000**  
TOTAL BOATING RELATED  
EXPENDITURES IN  
NEW JERSEY (2006)

**\$ 1,100,000,000**  
TOTAL BOATING RELATED EXPENDITURES IN  
NEW YORK CITY / LONG ISLAND / HUDSON  
RIVER (2008)

**\$ 554,000,000**  
TOTAL BOATING RELATED  
EXPENDITURES IN  
CONNECTICUT (2013)

**\$ 17,700,000**  
LANDED VALUE, LONG  
MONTAUK  
FISHING PORT (2010)

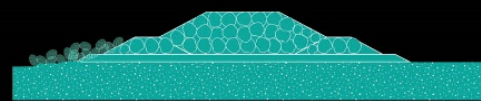
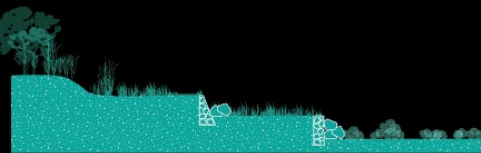
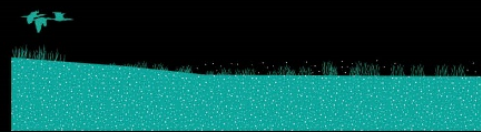
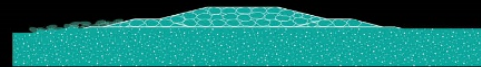
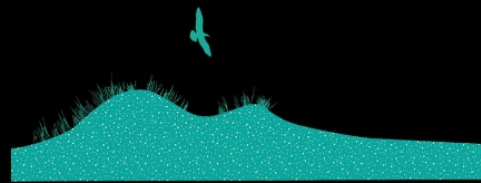
**\$ 22,800,000**  
LANDED VALUE, LONG  
POINT PLEASANT  
FISHING PORT (2010)

**\$ 25,800,000**  
LANDED VALUE, LONG  
BEACH-BARNEGAT  
FISHING PORT (2010)

**\$ 17,300,000**  
LANDED VALUE  
ATLANTIC CITY  
FISHING PORT (2010)

# WATER-BASED ECONOMIES



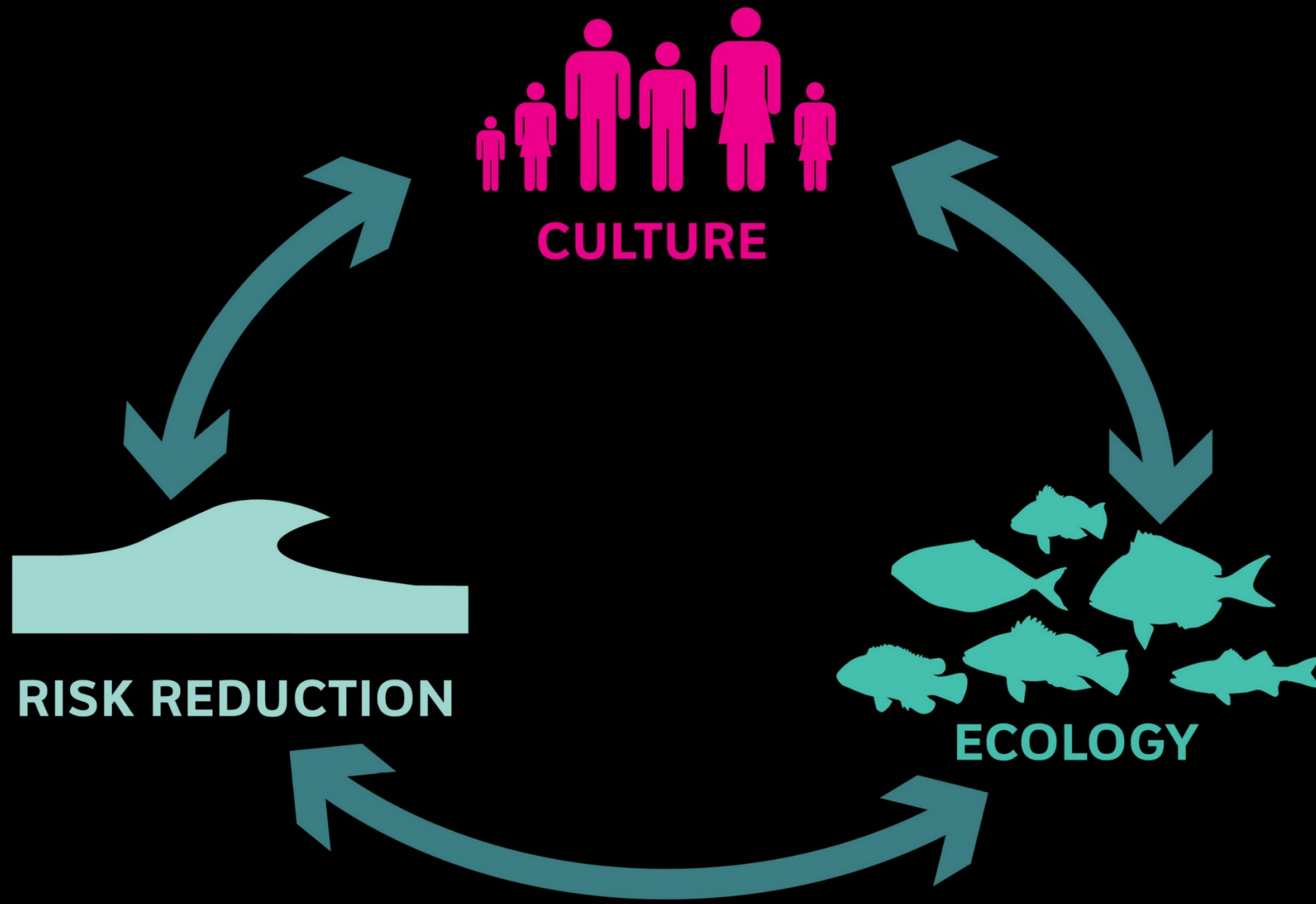


LOW SALT MARSH  
 HIGH SALT MARSH  
 MARITIME SHRUBLAND  
 MARITIME FOREST  
 MARITIME MUD FLAT  
 BEACH  
 DUNE  
 SALT PANNE  
 SALT SHRUBLAND  
 DUNE SLACK  
 SUBTIDAL REEF  
 BARRIER ISLAND

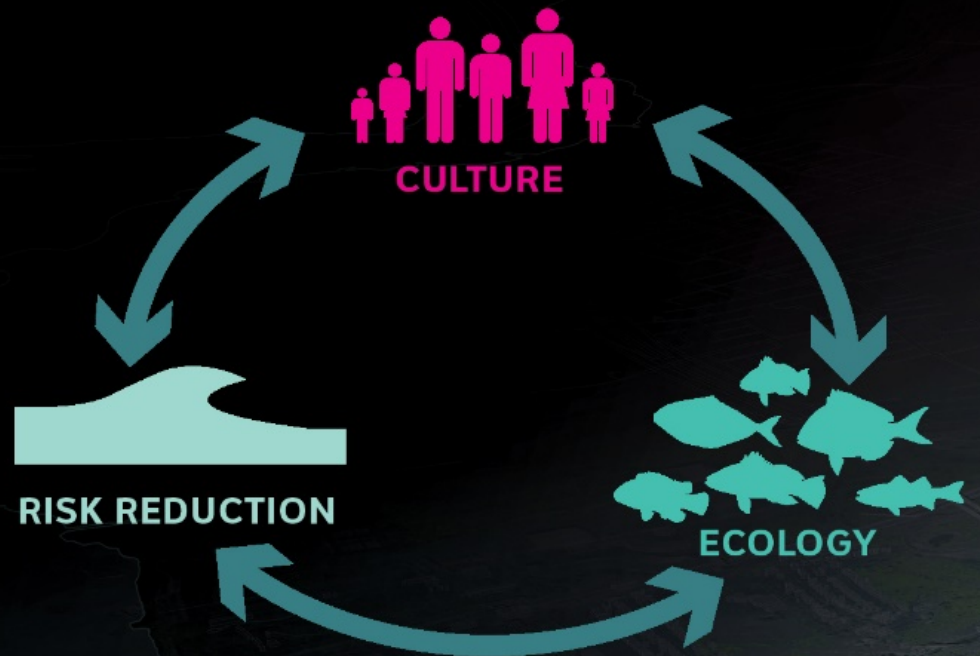


# THE SHALLOWS





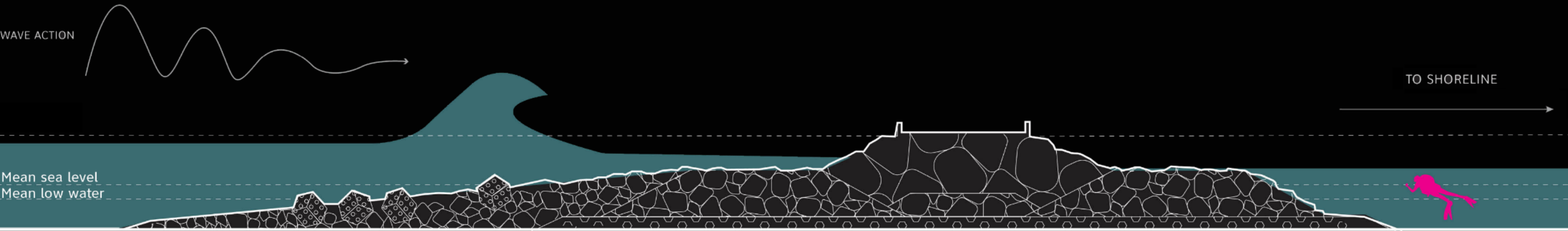




**REBUILD  
BY  
DESIGN**



# LIVING BREAKWATERS REDUCE COASTAL RISK



## DO:

ATTENUATE (REDUCE THE HEIGHT OF) STORM WAVES

REDUCE OR REVERSE LONG TERM EROSION

REDUCE EVENT-BASED EROSION

## DO NOT:

PREVENT FLOODING





SHORELINE PRIOR TO BW INSTALLATION



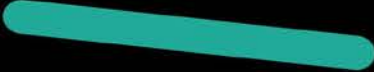
TOMBOLO



SALIENT



CREST



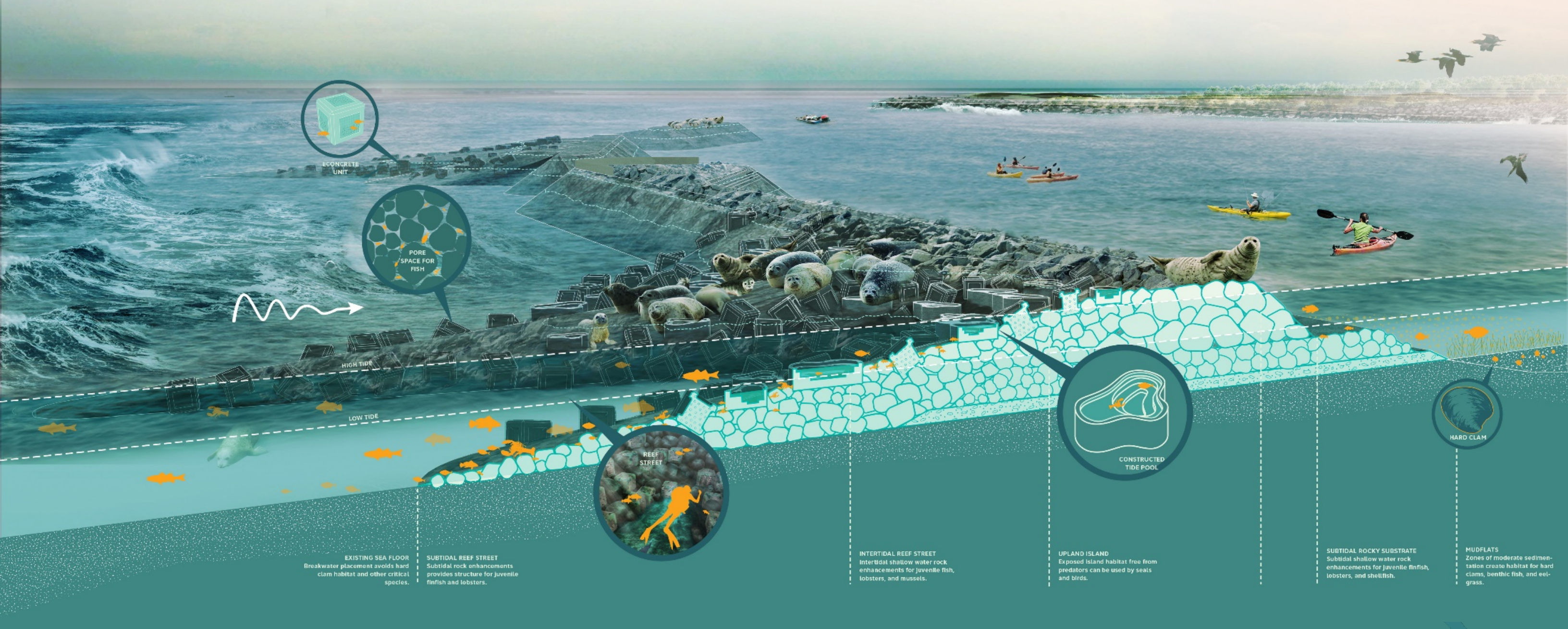
NO IMPACT



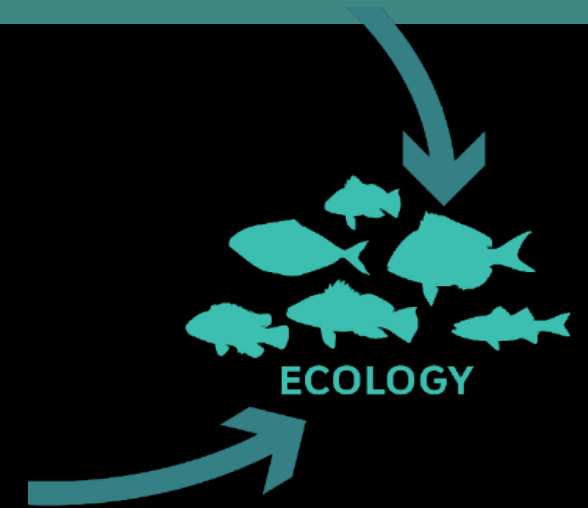
RISK REDUCTION



# LIVING BREAKWATERS ENHANCE ECOSYSTEMS



**CREATE HABITAT**  
**INCREASE BIODIVERSITY**  
**IMPROVE ECOSYSTEM HEALTH**





# LIVING BREAKWATERS FOSTER SOCIAL RESILIENCE



IMPROVE ACCESS TO THE SHORELINE

RAISE AWARENESS OF RISK

ENCOURAGE STEWARDSHIP





APRIL 30, 2015 | Albany, NY

# Governor Cuomo Announces \$60 Million Living Breakwaters Barrier to Protect Staten Island Shoreline and Habitat

STORM RECOVERY



EXISTING SEA FLOOR  
Underlying geology consists of  
various types of rock and shell  
fragments.

EXISTING ROCK BARRIER  
Existing rock barrier consists  
of various types of rock and  
shell fragments.

INTERMEDIATE ROCK BARRIER  
Intermediate rock barrier will  
be constructed to provide  
additional protection for  
residential park.

UPLAND ISLAND  
Exposed island habitat free from  
precipitation will be used  
to provide habitat for birds.

HISTORICAL ROCKY SUBSTRATE  
Historical rocky substrate will  
be used to provide habitat  
for juvenile fish.

SHORELINE  
Shoreline will be  
restored to its  
original position.