

OCEAN ECONOMY

A TRANSFORMATIONAL ECONOMIC RECOVERY STRATEGY

DEVELOPING A ROBUST AND RESILIENT OCEAN ECONOMY FOR
PUERTO RICO TO SUPPORT ECONOMIC GROWTH

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PR Economic Transformation Plan 1940's

Shift from an Agrarian Economy to an Industrial Economy

Lessons learned:



1940's



2000's



- Identify key areas that need to be strengthened in order to sustain growth
- Transformation is achieved through vision, vision guides strategies, strategies define plans
- “The whole is greater than the sum of its parts” - Aristotle

Economic Recovery Strategy

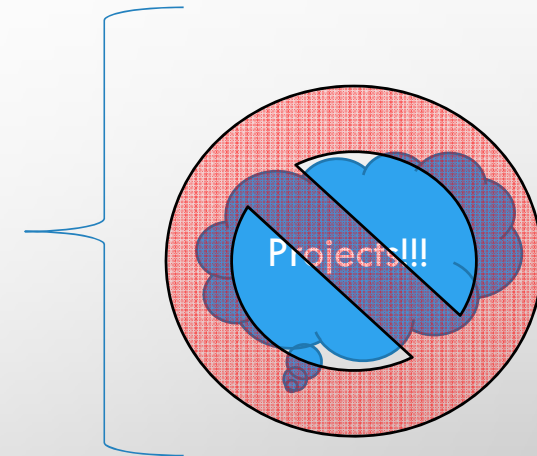


No Nexus



No

Transformation



Random projects don't drive economic growth...

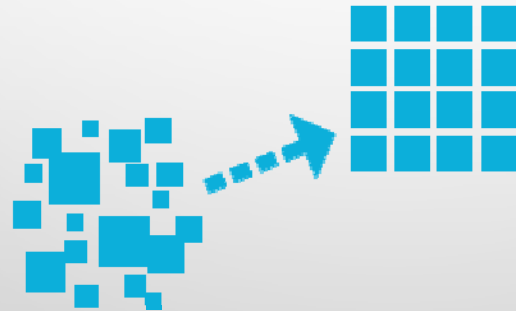
The opportunity lies in a holistic approach to develop

Cross-Functional Solutions

Econ RSF: Economic Development Strategy



Nexus



Transformational

VISION

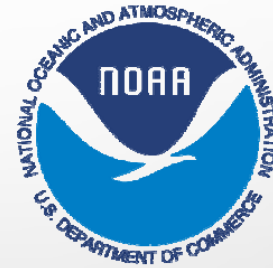


Opportunities
Strategies

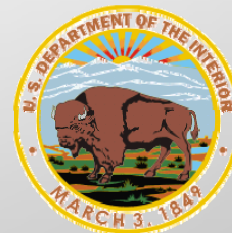
Federal Partners already aligned to deploy resources
and/or assist in
Puerto Rico's BLUE Economy Initiative



**US Army Corps
of Engineers®**



FEMA





BLUETIDE

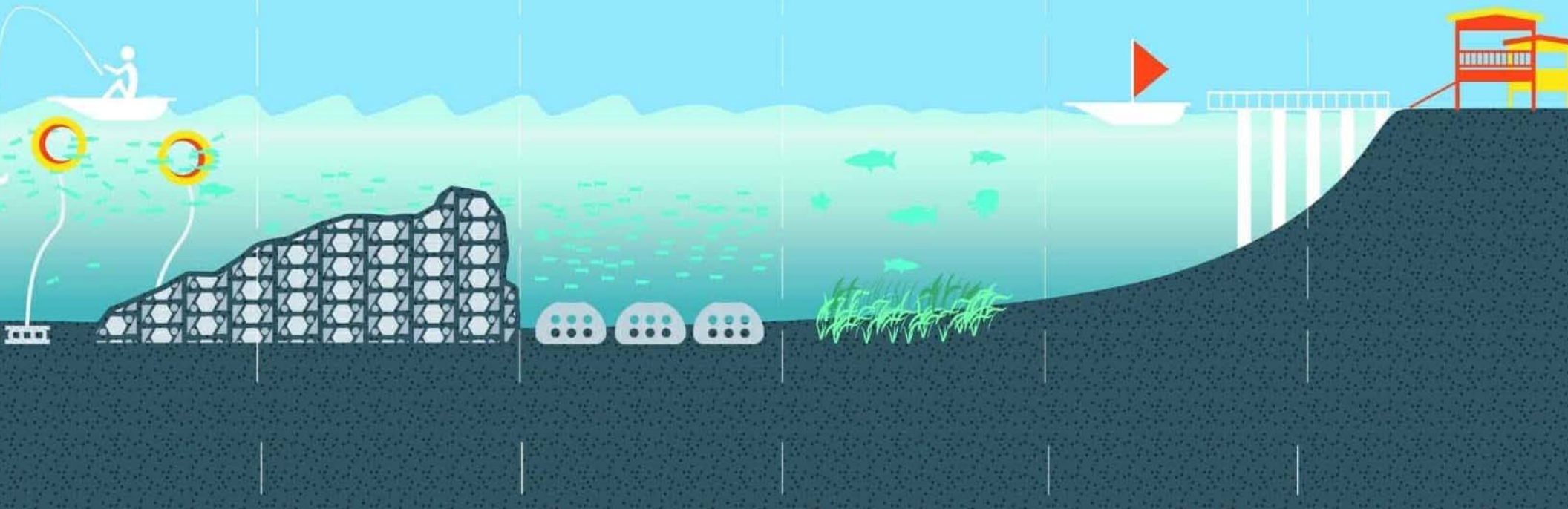
INITIATIVE

PUERTO RICO



BLUETIDE

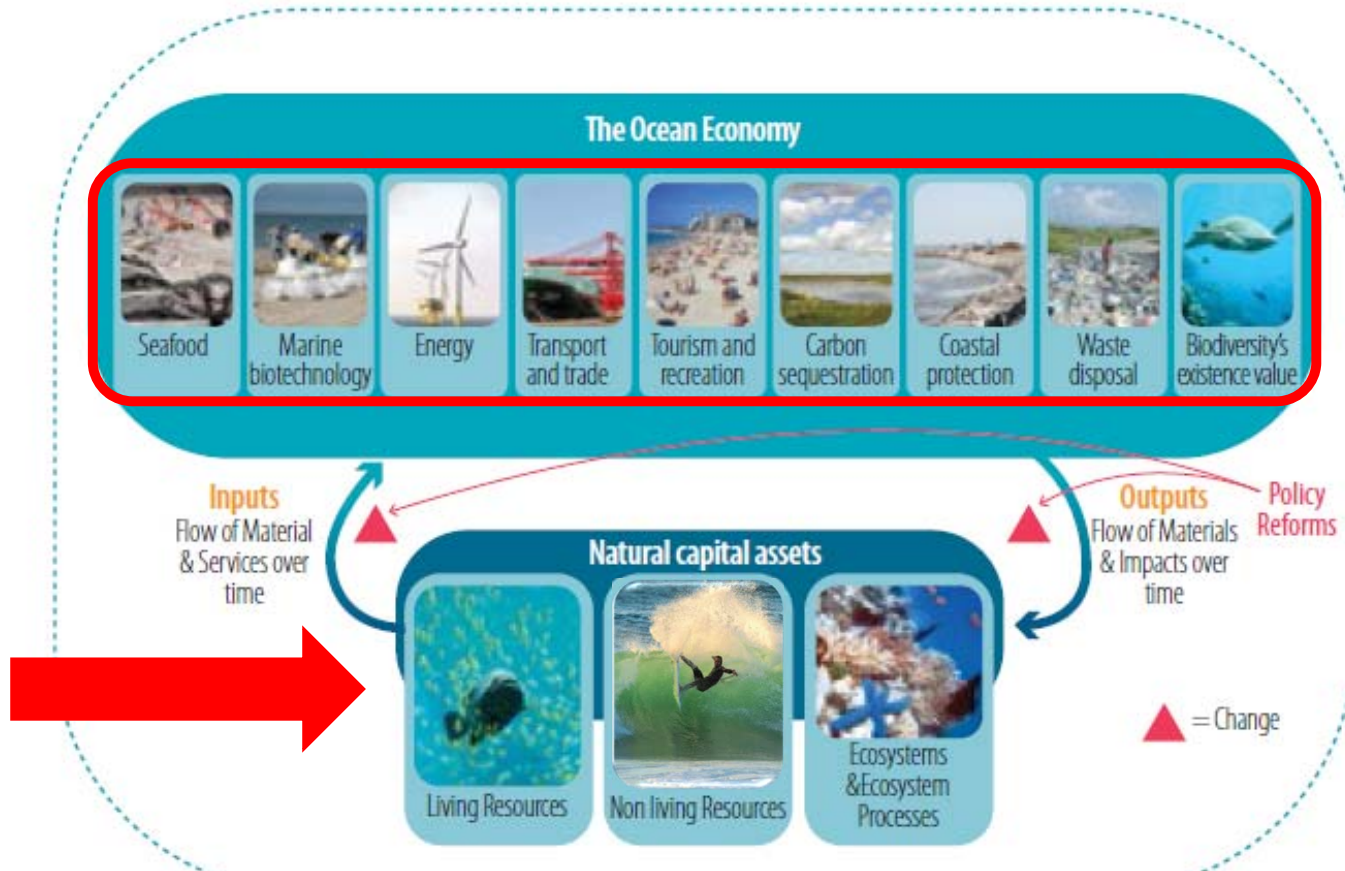
INITIATIVE



WHY THE OCEAN ECONOMY AS AN ECONOMIC RECOVERY STRATEGY FOR PUERTO RICO?

- PUERTO RICO EXPRESSED THAT TOURISM IS AN AREA OF INTEREST FOR ECONOMIC GROWTH- (**INCREASE TOURISM 2X**)
 - THE ECONOMIC DEVELOPMENT & COMMERCE DEPARTMENT IS CURRENTLY LOOKING AT DEVELOPING AN OCEAN SCIENCE AND TECH PARK
 - PR IS AN ISLAND
 - THE BLUE ECONOMY PRESENTS A DIVERSIFIED ECONOMIC GROWTH OPPORTUNITY, TOURISM BEING A KEY COMPONENT
- *FLORIDA HAS BEEN DEVELOPING A STRATEGIC ROADMAP FOR INNOVATION & GROWTH IN THE MARINE SCIENCES CLUSTER (2015)*
- *THE WORLD BANK GROUP PUBLISHED: TOWARD A BLUE ECONOMY: A PROMISE FOR A SUSTAINABLE GROWTH IN THE CARIBBEAN (2016)*

The Blue Economy—A Conceptual Framework



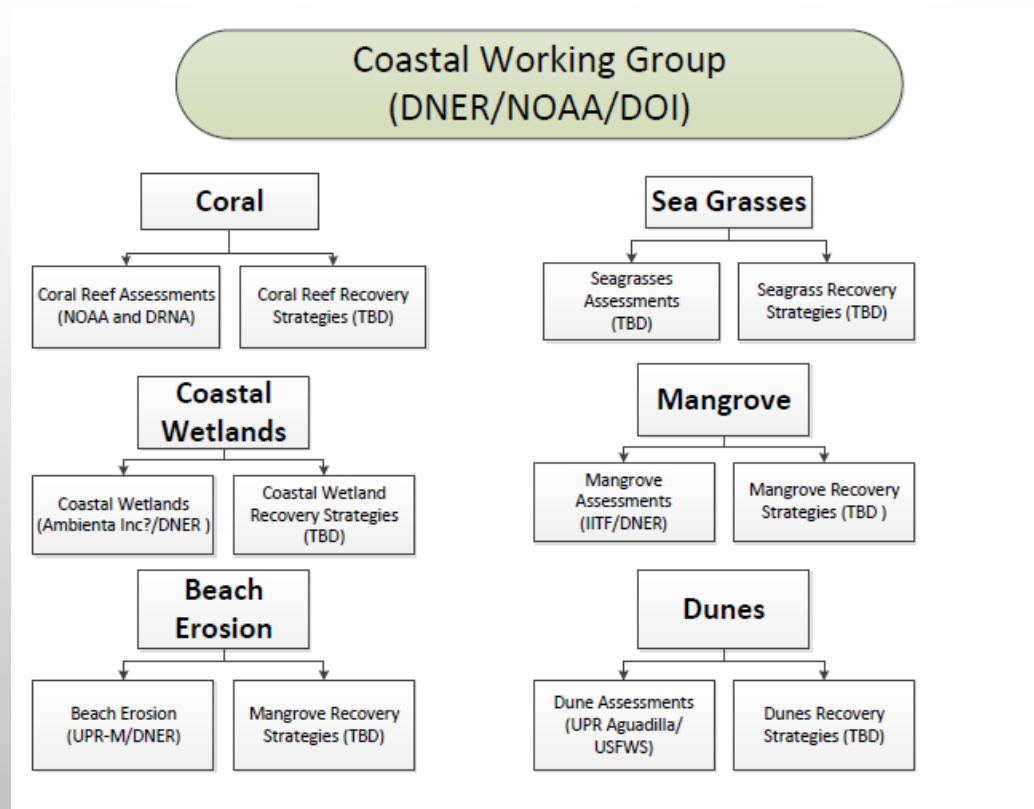
Economic Activities

**SUPPORT
INFRASTRUCTURE
For
ECONOMIC
GROWTH**

Toward a Blue Economy: a Promise for a Sustainable Growth in the Caribbean
-World Bank Group 2016

CURRENT **NCR-RSF** COASTAL WORKING GROUP TOURISM ANCHOR ASSETS

Assessment
Impacts

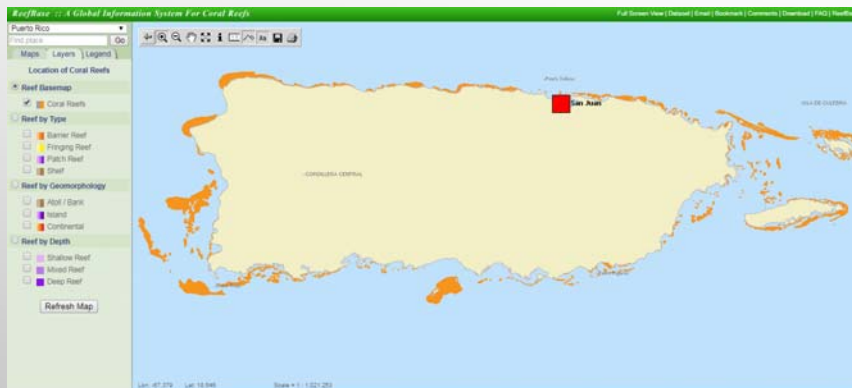


Implement
Recovery
Strategies

CORAL REEF VALUED AT \$1.9 BILLION (ROBERT CONSTANZA, CRAWFORD SCHOOL OF PUBLIC POLICY, NATIONAL UNIVERSITY OF AUSTRALIA, IN 2014)

80% SEVERELY DAMAGED

Puerto Rico has approximately 700 miles of shoreline
(NOAA Office for Coastal Management)



Describing the Ocean Economies of the U.S. Virgin Islands
and Puerto Rico, NOAA 2016

Ocean Sectors	Establishments	Employment	Total wages (\$)
Living Resources	14	10	\$145,331
Marine Construction	19	642	\$19,816,175
Marine Transportation	123	3,406	\$103,046,969
Offshore Mineral Resources	43	17	\$334,582
Ship and Boat Building	5	ND	ND
Tourism and Recreation	4,091	62,645	\$798,495,848
Ocean Economy	4,295	66,720	\$921,838,905
Total Economy	48,513	929,764	\$24,903,000,000
Ocean Economy Share	9%	7%	4%

Note: "ND" represents data that are "non-disclosed" for privacy purposes for industries below a certain size.

Ocean Economy estimated total wages \$922 M/yr.

Comparison of Sport Angler contribution to the Ocean Economy vs Commercial Fisheries

Sport Angler Expenditures

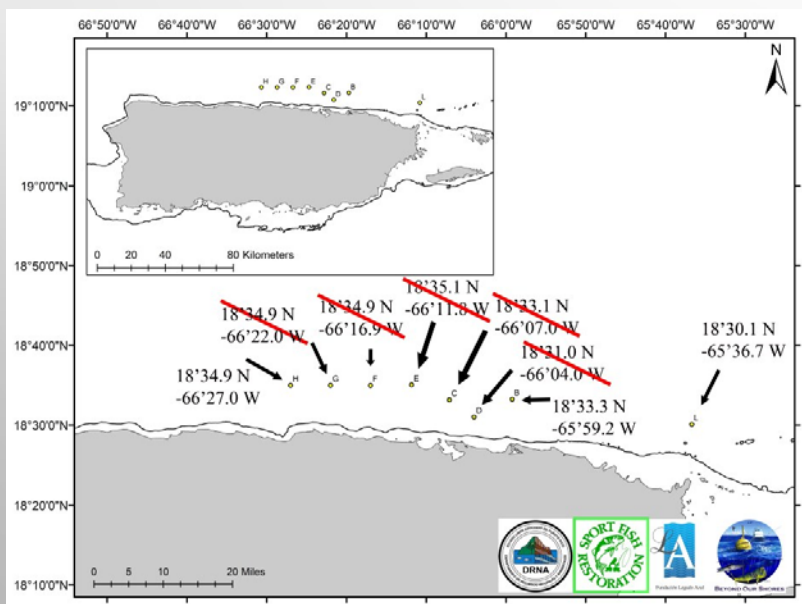
~100,000 recreational Fishermen



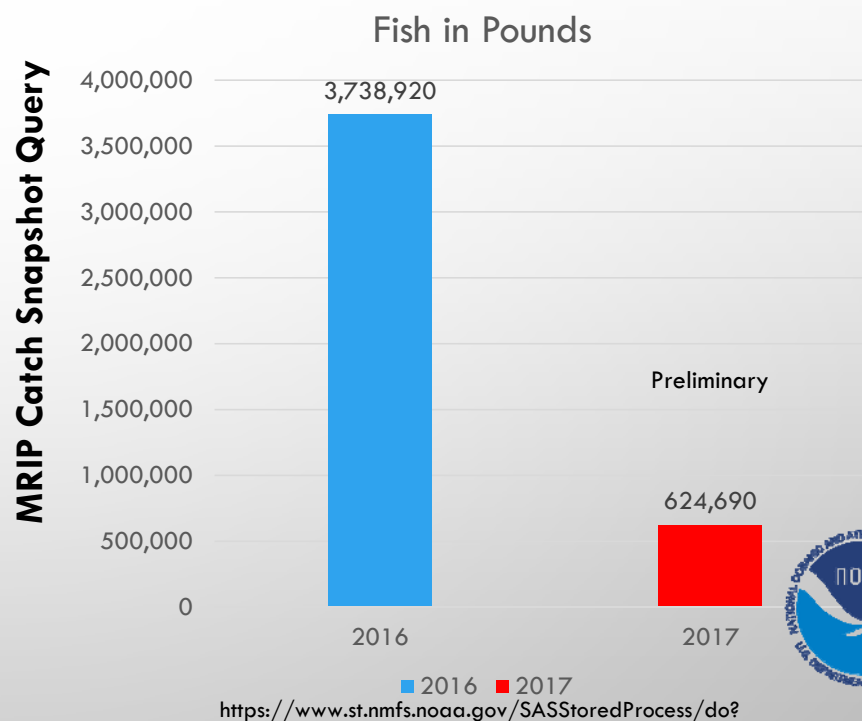
Commercial Fishermen
Catch Wholesale Value
\$6.9 million

Fishery Impact

Loss of 7 out of 8 Fish Aggregating Devices



42 fishing associations
868 active fishermen



<https://www.st.nmfs.noaa.gov/SASStoredProcess/do?>

Over 283 schools will not re-open in August Repurposing assets for BLUE Economy Business Innovation

Ag added value business incubation, Co-working spaces, Workforce Development Training Centers, SBIR workshop centers, Business Incubators and Accelerators, etc.



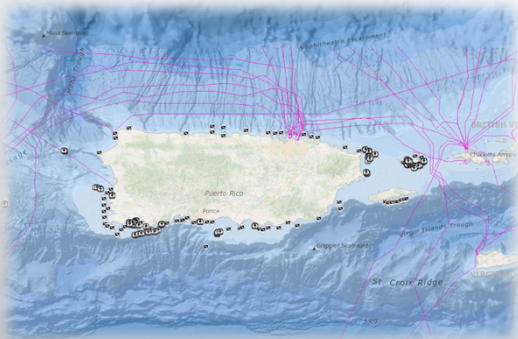
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Ocean Economy Impact on IOT and Informatics

All Fiber Communications is through underwater infrastructure around PR mainly in SJ



Data Driven Innovation



Marine Robotics



Modeling Climate Change



DEFINE STRATEGIES TO GROW TOURISM

- SUPPORT BEACH ACTIVITIES WITH LIMITED NEAR SHORE ASSETS?
 - NEED TO REDEFINE BEACHES AS CURRENTLY DEFINED IN CAT G MITIGATION*
- SUPPORT SEAFOOD CONSUMPTION WHEN THERE IS LIMITED FISHERY CAPACITY?
- GROW MARINE BUSINESS INNOVATIONS WITH INADEQUATE INFRASTRUCTURE?
- SUPPORT OCEAN ECONOMIC ACTIVITY THROUGHOUT PR WITH NO INTERCONNECTIVITY AMONGST PROJECTS?
- EMPOWER PUERTO RICO TO CROSS-INTEGRATE COASTAL ISLAND ASSETS?

DEVELOP MORE RESILIENCY TO ECONOMIC SUSTAINABILITY WITH CONSCIENTIOUS INVESTMENTS IN VISITOR ATTRACTION ASSETS!

PUERTO RICO OCEAN ECONOMY

Leadership & Coordination

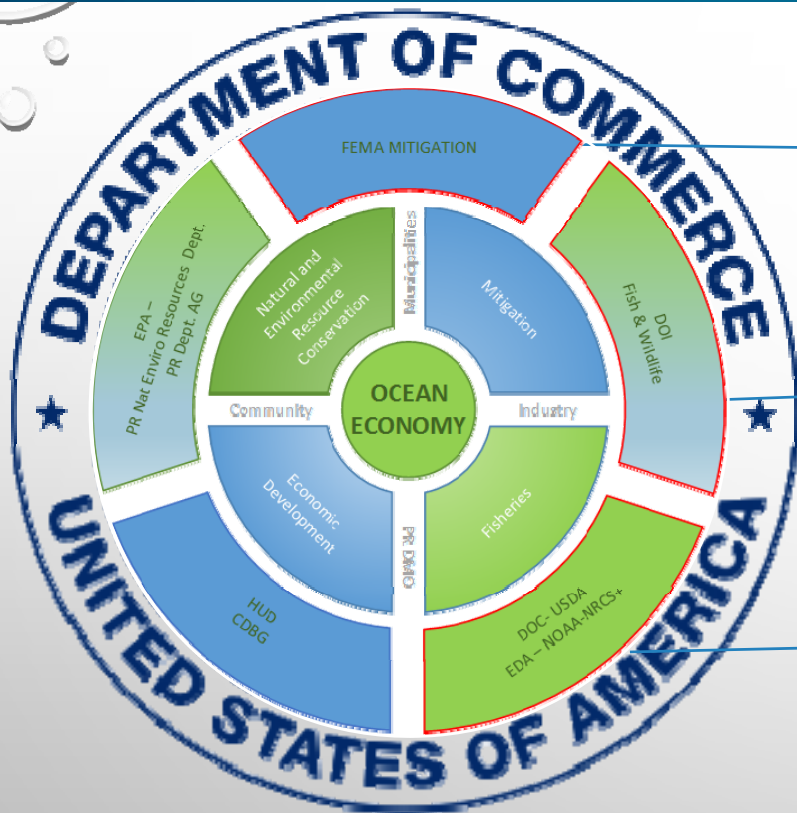


Tourism



Fishery

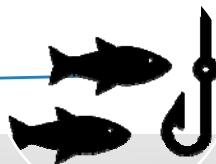




Protect



Stimulate



Sustain

Inter-agency Approach

Economic Development Opportunity
Optimizing Ocean Economy Assets



FEMA

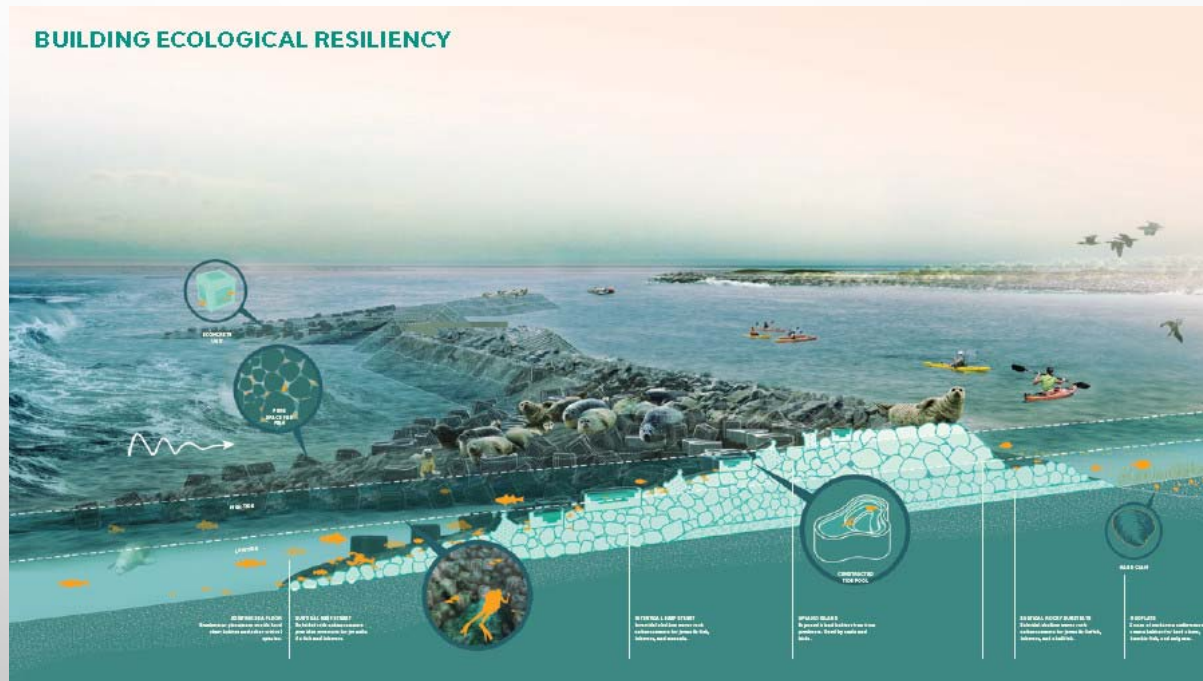
MITIGATION

Mitigation Coastal Storm Surge-Coastal Municipalities

Mitigation: Reduce coastal storm surge. Could be eligible for FEMA mitigation funds.



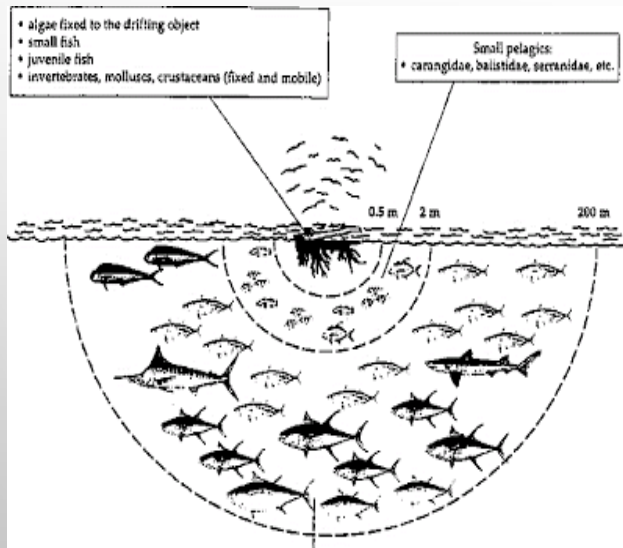
US Army Corps of Engineers.





FISHERY INFRASTRUCTURE

Living breakwater co-benefits:
supports fish breeding habitats



FAD Network
NOAA
DOI-WSFR

Artificial Reefs
NOAA

Mangroves



BLUETIDE INITIATIVE

ECONOMIC DEVELOPMENT INFRASTRUCTURE



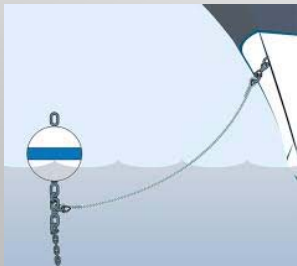
Mooring Buoy grid to protect reefs



Fishing Boats and Marinas

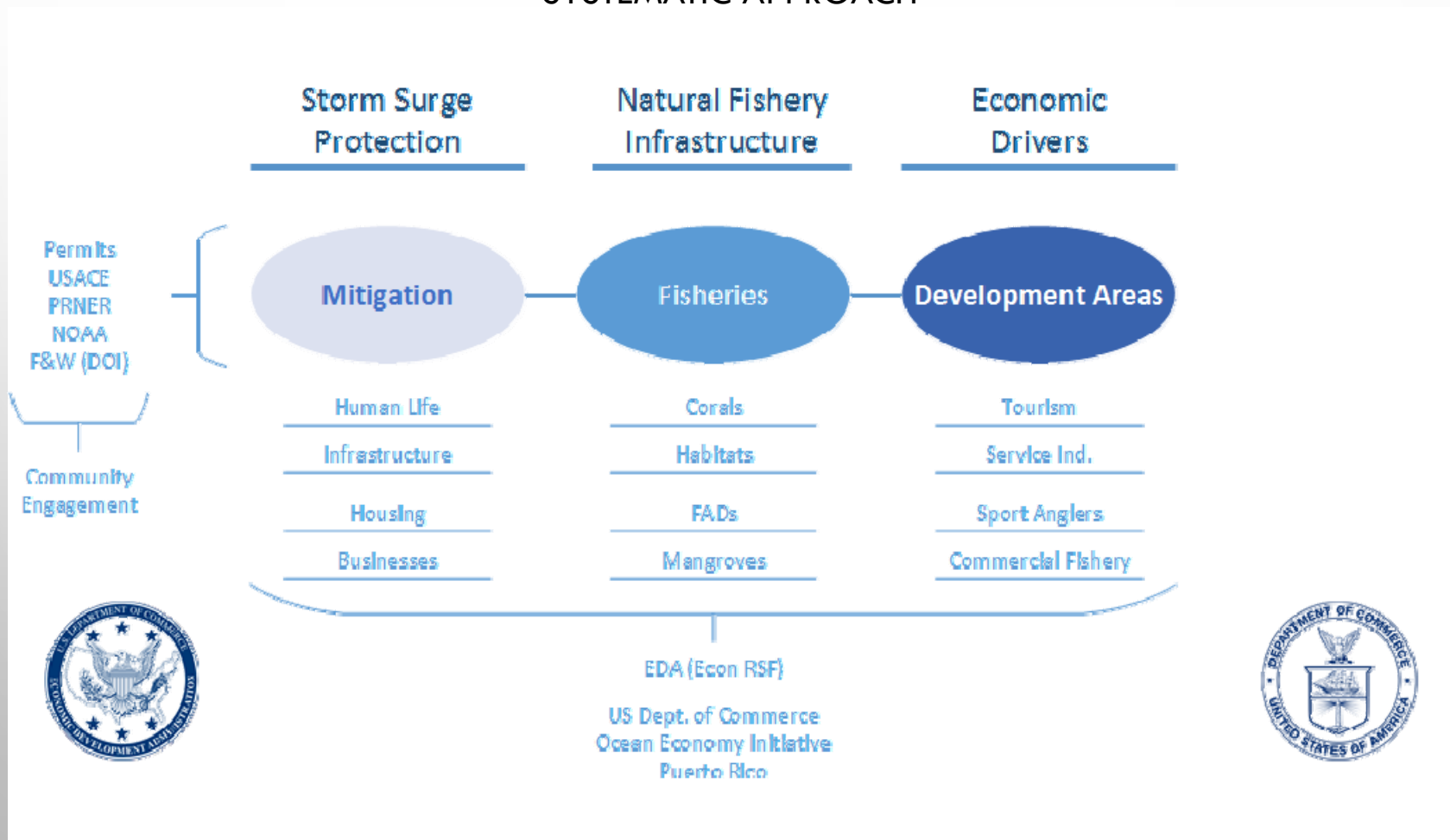


Fresh Fish Markets and Fishing Villages



Outreach & Community Engagement

SYSTEMATIC APPROACH



OUTREACH TO STAKEHOLDERS TO RECRUIT PARTNERS AND CHAMPIONS

- UPRM CENTER FOR APPLIED OCEAN SCIENCE & ENGINEERING- CARICOOS
 - UNIVERSITY OF PR, MAYAGUEZ SEA GRANT PROGRAM
- ATLANTIC CARIBBEAN CENTER FOR MARINE INNOVATION & RESEARCH (ACCMIR)
- OCEAN ECONOMY RELATED TRADE ASSOCIATIONS AND NONPROFITS
- PR SCIENCE AND TECHNOLOGY RESEARCH TRUST
- DIVE SHOPS THROUGHOUT PR
- COASTAL MUNICIPALITIES (MITIGATION NEEDS FOR STORM SURGE PROTECTION)
- PR MARINE MAMMAL STRANDING NETWORK

BLUETIDE INITIATIVE

OCEAN ECONOMY INFRASTRUCTURE

Fish Aggregating Devices FADs

Living Breakwaters

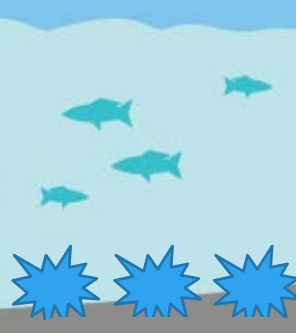
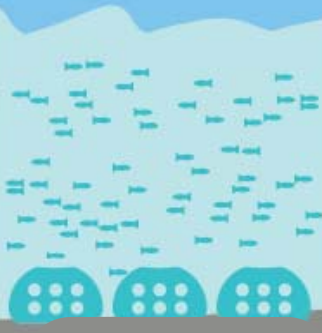
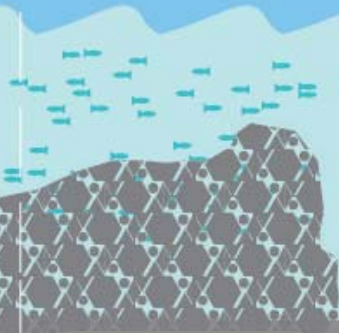
Underwater Fishery Infrastructure

Fish Habitats

Boats, Piers, Marinas, Boardwalks

Marine Innovation & Research Ctr. Business Incubators, Fish Nursery, Fish Markets, Fishing Villages...

TRANSFORMATIONAL INVESTMENTS



BLUETIDE INITIATIVE

30+ FADs

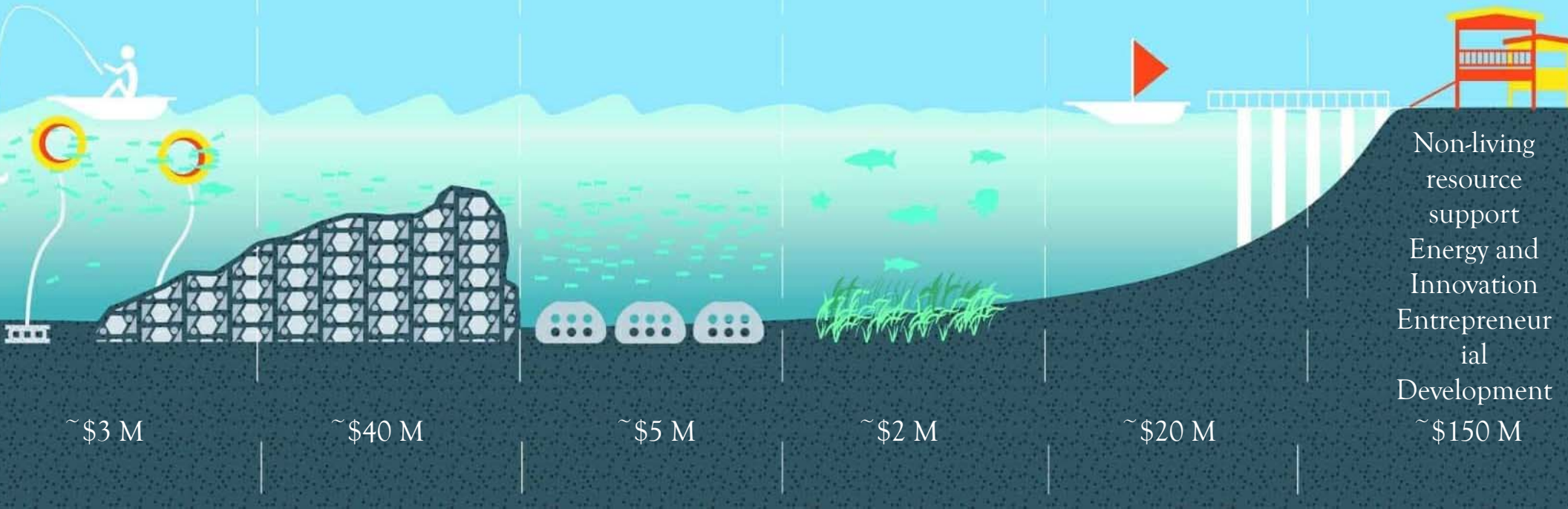
8 projects
Living Breakwaters

20 sites for
underwater
fishery infra-
structure

20 sites for
fishery
nurseries

50 sites for
near
shore/shore
fishery infra-
structure

Marine Research
Center
Incubators
Accelerators
Fish Markets
Fishing Villages
Water treatment
facilities
Business Support
Work Force
Development



~\$3 M

~\$40 M

~\$5 M

~\$2 M

~\$20 M

~\$150 M

Q & A

