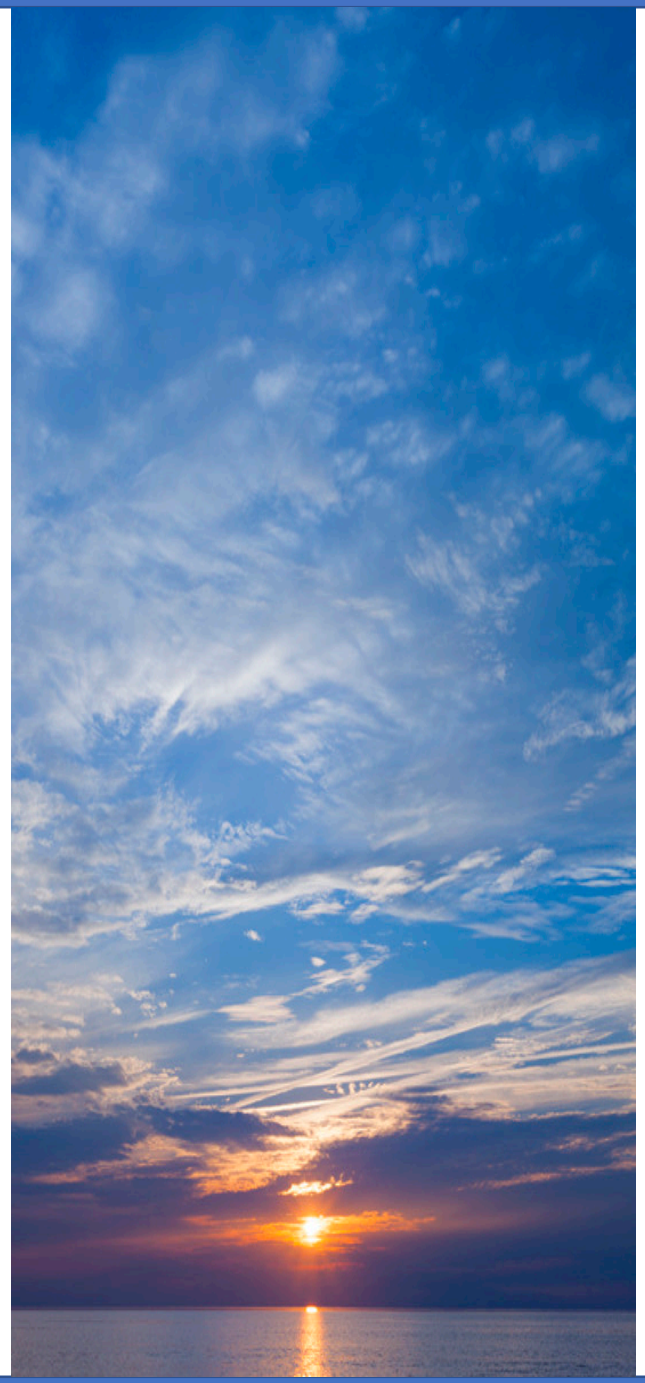


MID-ATLANTIC
FISHERY MANAGEMENT COUNCIL

Mid-Atlantic Fishery Management Council and ACFHP

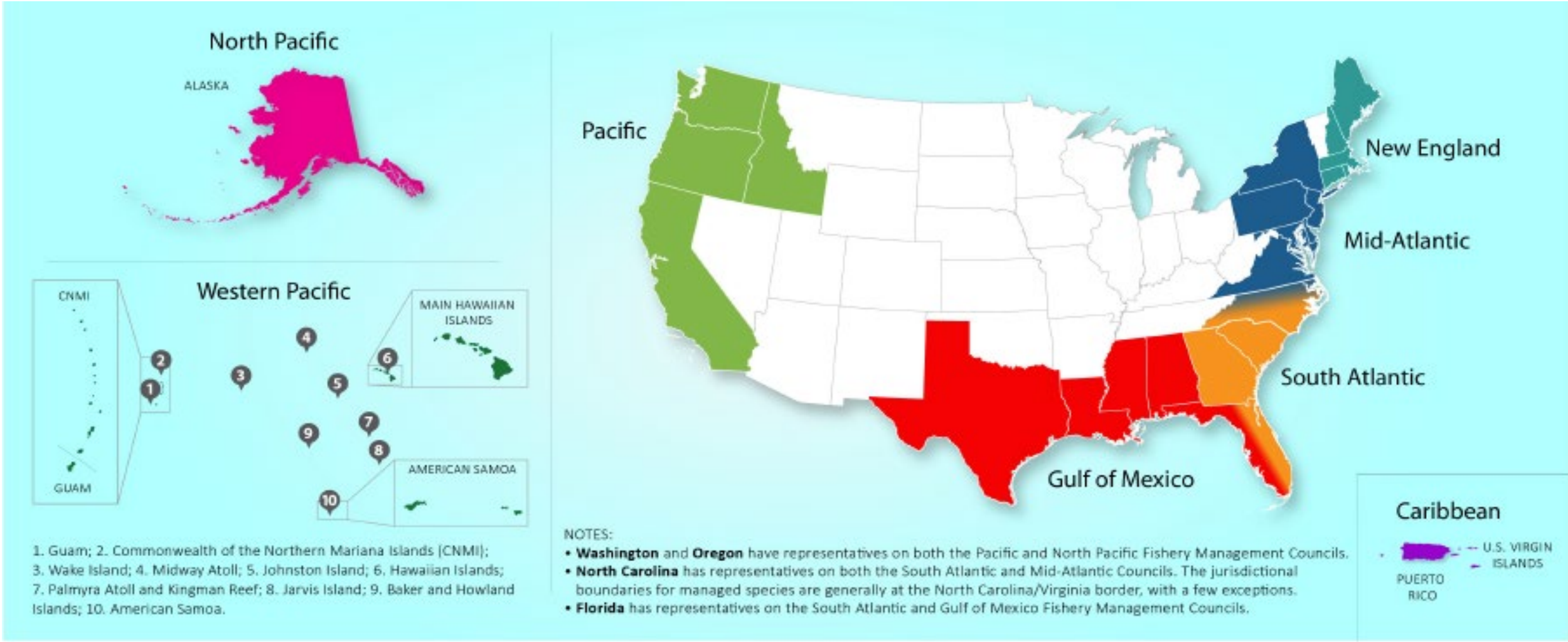
ACFHP Steering Committee Meeting

Jessica Coakley, MAFMC Staff

May 22-23, 2019

The Councils

Develop and amend fishery management plans for approval/implementation by the National Marine Fisheries Service (NMFS) on behalf of the Secretary of Commerce



1. Guam; 2. Commonwealth of the Northern Mariana Islands (CNMI); 3. Wake Island; 4. Midway Atoll; 5. Johnston Island; 6. Hawaiian Islands; 7. Palmyra Atoll and Kingman Reef; 8. Jarvis Island; 9. Baker and Howland Islands; 10. American Samoa.

NOTES:

- **Washington** and **Oregon** have representatives on both the Pacific and North Pacific Fishery Management Councils.
- **North Carolina** has representatives on both the South Atlantic and Mid-Atlantic Councils. The jurisdictional boundaries for managed species are generally at the North Carolina/Virginia border, with a few exceptions.
- **Florida** has representatives on the South Atlantic and Gulf of Mexico Fishery Management Councils.

US Fisheries Management

- Inland Waters
  - Department of the Interior (US F&WS)
- State waters (up to 3 mi)
  - Fishery Commissions
  - State Natural Resource Agencies
- Marine Federal waters (>3mi-200 mi)
  - Department of Commerce (NOAA Fisheries/Councils)

Mid-Atlantic Council

7 States

64+ Species
7 Fishery Management Plans

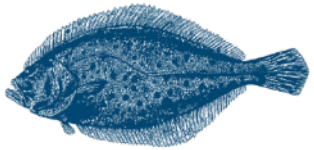
Longfin Squid

Shortfin *"Illex"* Squid

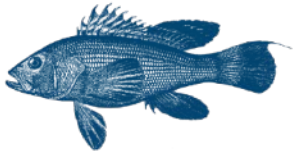
Butterfish

Atlantic Mackerel

Bluefish

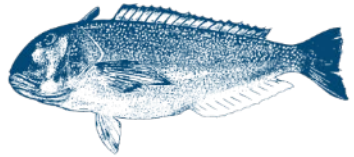


Summer Flounder

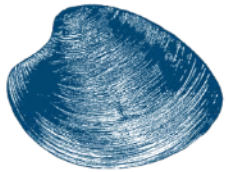


Black Sea Bass

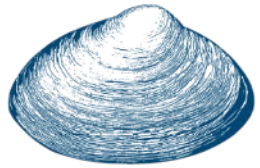
Scup



Golden Tilefish



Ocean Quahog



Atlantic Surfclam

Blueline Tilefish

Spiny Dogfish

Monkfish

Ecosystem Component Species (Unmanaged Forage)

Why become a member?

- Council would benefit from improved understand of threats to healthy fish habitat.
- Requires making the connection between headwater and continental shelf habitats.
- Strengthening relationships with partners and management bodies along that

Why become a member?

- Council can contribute by helping to prioritize actions and policies that protect, restore, or maintain resilient habitats that optimize ecosystem functions and services to the benefit of both fish and wildlife.

Council Mission and Vision

- Mission: Healthy and productive marine ecosystems supporting thriving, sustainable marine fisheries that provide the greatest overall benefit to stakeholders.
- Vision: "…The Council is committed to the effective stewardship of these fisheries and **associated habitats**…"

Conclusions

1. To carry out their mutual intent to design and implement an ACFHP plan….

   The Council can contribute to the development of an ACFHP plan that considers the importance of nearshore fish habitat resource needs to offshore fish and ecosystem productivity.

2. To work together to facilitate current and future mutually agreed upon joint …activities.. for the benefit of Atlantic fish habitat resources.

   The Council can contribute by helping ACFHP and its partners prioritize regional habitat needs as well as prioritizing fish habitat conservation, protection, and restoration activities.

3. To use the resources of their agencies and organizations in a manner consistent with their mission and the mission of ACFHP…..

   The Council will continue to pursue management measures and policies that are consistent with its commitment to the effective stewardship of its fisheries and associated habitats. The Council will also pursue opportunities to mutually support ACFHP and its efforts where they align.

Conclusions

4. To collectively pursue funding initiatives…

The Council will support ACFHP efforts to pursue funding opportunities and will provide the weight of its support for its habitat activities as appropriate.

5. To collectively pursue interagency/organization agreements, cooperative agreements, grants, and/or contracts to fund approved projects.

The Council will work with ACFHP partners as they to pursue opportunities to fund approved projects.

6. To encourage and support the participation of other appropriate agencies and organizations by mutual agreement of the partners.

As a partner, the Council will help identify opportunities to bring in other groups and partners where it may be of benefit to ACFHP.

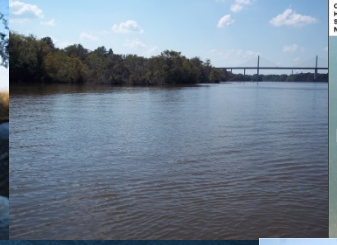
Thanks for your consideration!

U.S. FISH AND WILDLIFE SERVICE FUNDING FOR ACFHP PROJECT UPDATES

ON-THE-GROUND PROJECTS

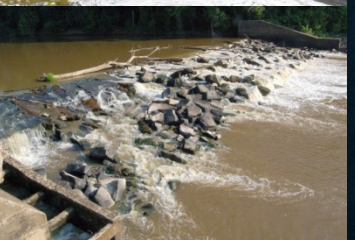
- From 2010 to 2018 – U.S. Fish and Wildlife Service funded 20 on-the-ground projects
- $672,234 awarded to partners
- Leveraged $11,948,033 matching funds and in-kind services
- Funding supported
  - 9 fish passage projects
  - 11 coastal habitat restoration projects
    - 3 marsh/mangrove restoration projects
    - 3 submerged aquatic vegetation (SAV) projects
    - 4 oyster reef restoration projects
    - 1 sturgeon spawning habitat restoration



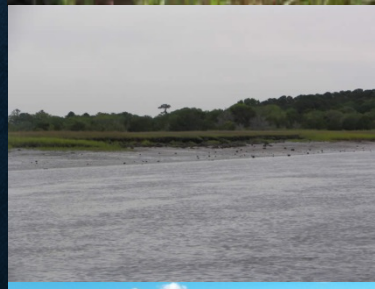




ON-THE-GROUND PROJECTS








ACFHP OPERATIONS

- From 2014 -2018 - U.S. Fish and Wildlife Service provided funding for ACFHP Operations
- $251,125 awarded to ASMFC
  - 2018 - $66,125
  - 2017 - $75,000
  - 2016 - $50,000
  - 2015 - $30,000
  - 2014 - $30,000

RANKED LIST FOR FY18 FUNDING

TOTAL ACFHP ALLOCATION - $214,585

COORDINATION - $75,000 (NO INDIRECT)
PROJECTS - $139,000 (15% INDIRECT)

TITLE	PROPOSED	To Project	NOTES
ACFHP Operations FY18	$75,000	$66,125	
Columbia Dam Removal	$50,000	$50,000	
Oyster Reef Restoration in Back sound Rachel Carson Reserve, Beaufort, NC	$49,833	$49,833	
Seagrass Conservation Moorings, Coecles Harbor, Shelter Island, NY	$32,001	$17,965	NOAA $14,035
Dam Removal on Childs River, Falmouth, MA	$49,450		request removed
Restoration of Submerged Aquatic Vegetation in Vegetation in Freshwater and Meso-haline Region of Region of the Chesapeake Bay MD	**$16,020**	**~~9,725~~**	**funding refused**
Total	$272,304	$183,923	
Remainder			

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Total	$272,304	$183,923	
Remainder			

FY19 RECOMMENDED PROJECTS

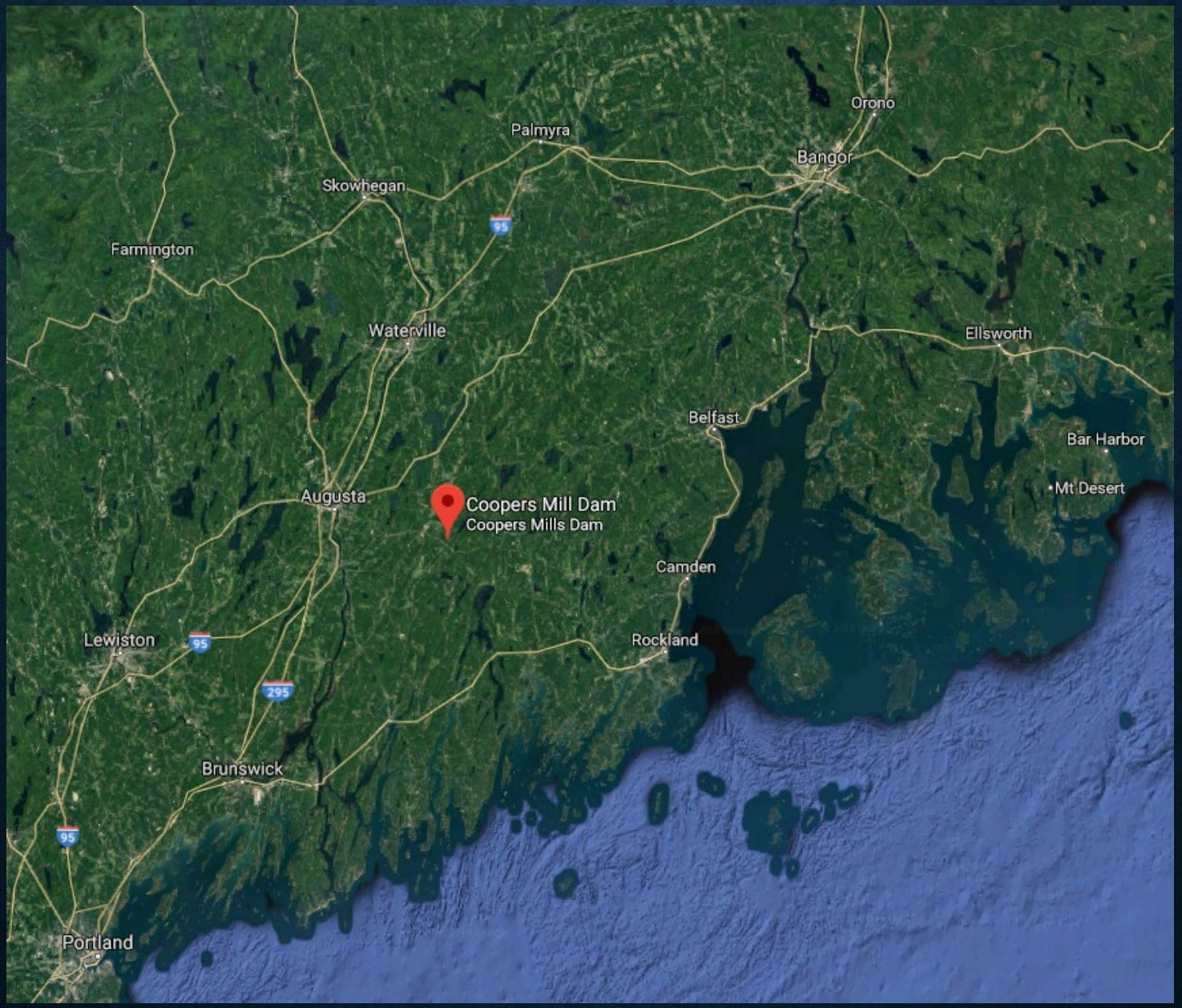
Name	State	Avg. Score	Request	Match
Whitford Pond Dam and River Restoration Design, Mystic River	CT	186.3	$50,000	$271,000
Restoration of SAV in the Freshwater and Meso-haline Region of the Chesapeake Bay **	MD	172	$16,895	$30,018
Outlet Stream/Box Mill Dam, North Vassalboro	ME	178.5	$50,000	$335,027
Old Mill Pond Dam Fish Passage, Wreck Pond Brook	NJ	159.3	$50,000	$89,718
Finding the Right Mix: Developing Best Practices for Cement/Oyster Composition Artificial Reefs **	FL	145.5	$48,091	$57,525
Repair of Fish Ladder in Pennamaquan River	ME	145	$50,000	$77,500
Desden Bog Wildlife Management Area Fish Passage Project	ME	140	$50,000	$57,750
Removal of Abandoned Dam on Smelt Brook	ME	105	$7,500	$6,756

SHEEPSCOT RIVER BARRIER REMOVAL, ME

Coopers Mill FY17 - $15,000 Total - $930,600
Head Tide FY17 - $35,000 Total - $446,000

- Coopers Mill Dam Removal and Head Tide Partial Removal
- Opens 71 miles for Atlantic salmon and other species
- Southernmost Atlantic salmon river designated as Critical Habitat
- Timeframe: Coopers Mill completed summer/fall of 2018. Head Tide will occur in 2019.

COOPERS MILL DAM



COOPERS MILL DAM REMOVAL

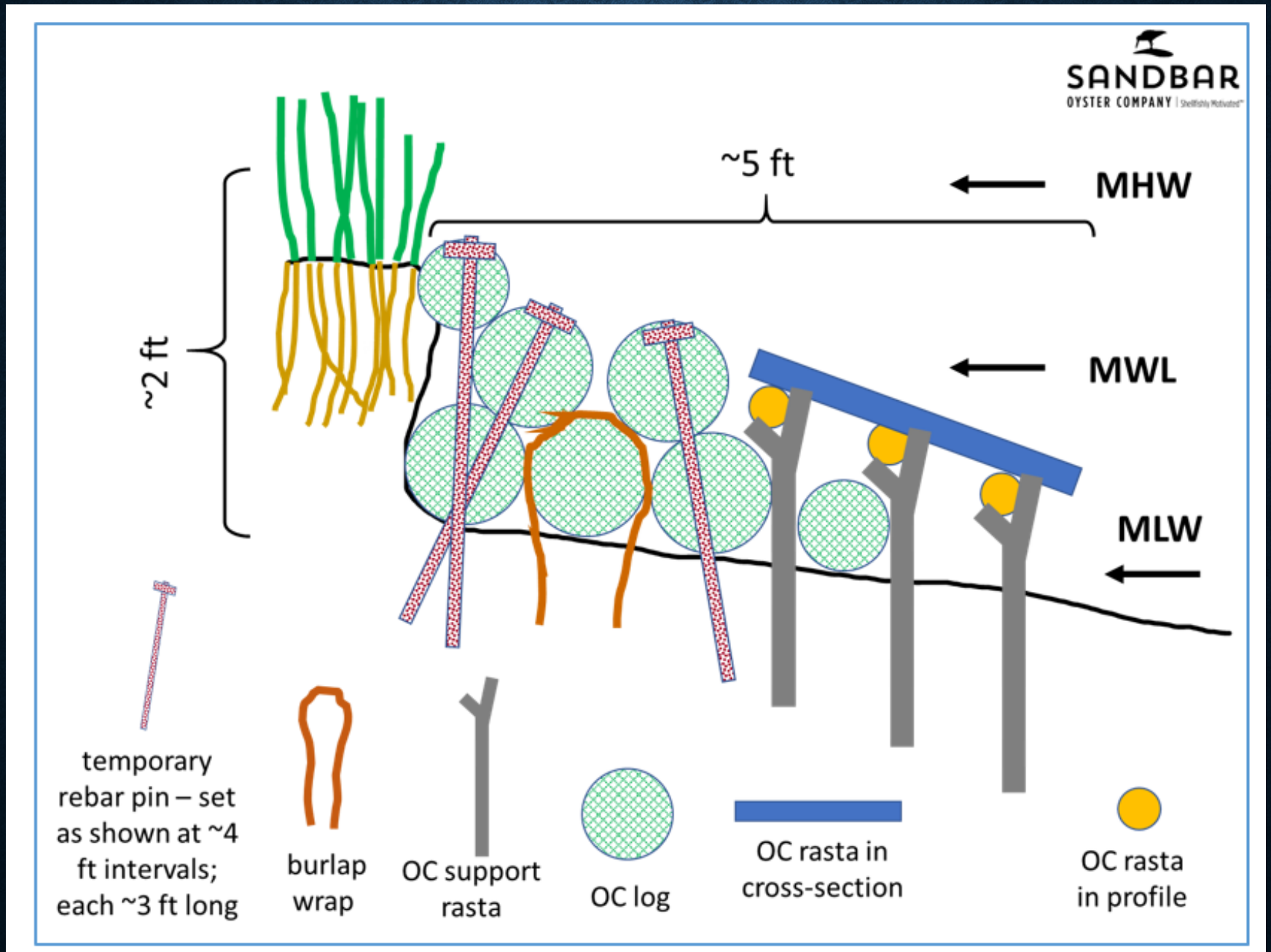
DRY HYDRANT INSTALLED

OVERLOOK

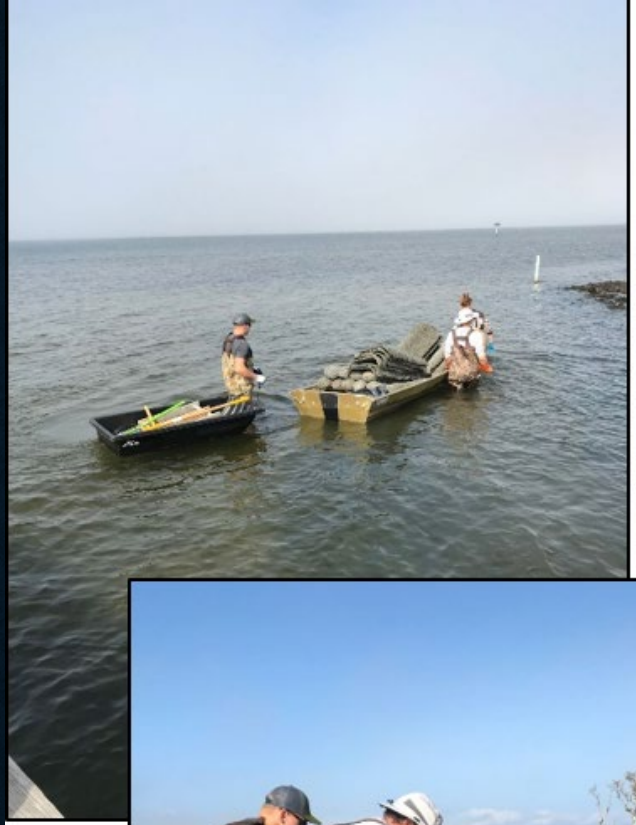
BOGUE SOUND, OYSTER REEF AND ESTUARINE SHORELINE RESTORATION

FY18 - $38,110 Total - $77,236

- Recycled oyster shells placed along 300 ft. of shoreline to promote saltmarsh
- Nursery habitat for black sea bass, red drum
- Feeding ground for summer flounder
- Timeframe: summer 2018


SANDBAR
OYSTER COMPANY
~5 ft
MHW
~2 ft
MWL
MLW
temporary rebar pin – set as shown at ~4 ft intervals; each ~3 ft long
burlap wrap
OC support rasta
OC log
OC rasta in cross-section
OC rasta in profile

OYSTER CATCHER LOGS



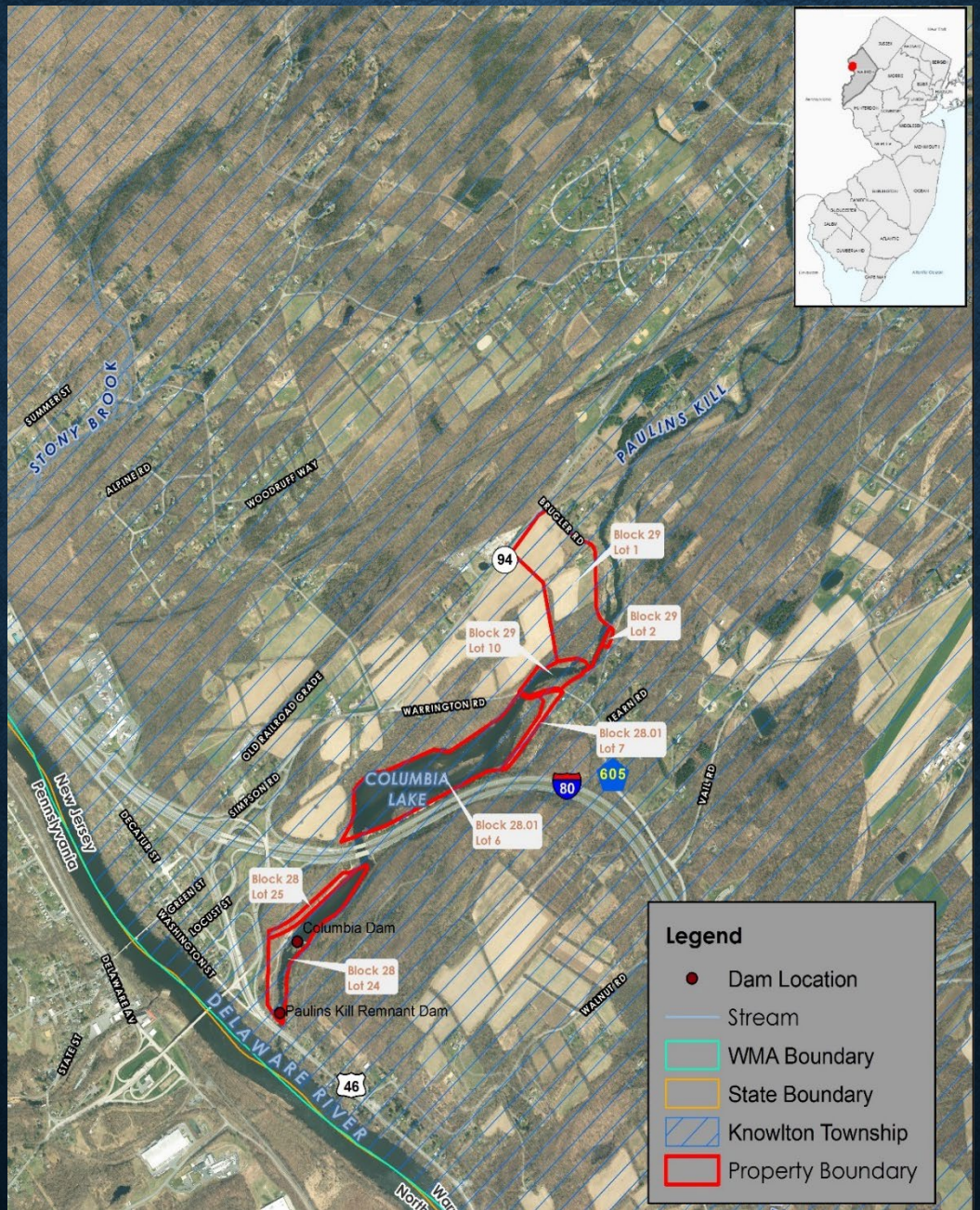
FEBRUARY 21, 2019

COLUMBIA DAM REMOVAL, KNOWLTON TOWNSHIP, NJ

FY18 - $50,000 Total - $7,193,000

- Remove dam to open 20 river miles
- First obstruction to passage off the Delaware River in the Paulins Kill
- Received Delaware Watershed Conservation Funding
- Timeline: Removal began August, 2018

COLUMBIA DAM REMOVAL



COLUMBIA DAM REMOVAL

COLUMBIA DAM REMOVAL

DAM REMOVAL COMPLETED IN MARCH, SHAD FOUND UPRIVER IN APRIL!

FY19 USFWS FUNDING TIMELINE

- Typically instructions for FHP reports goes out in November
- This year – **May 7**
- Reasons for delay?
  - Request from board to increase coordination funding
  - Furlough
  - New National Coordinator – Eric MacMillan
- Due date for reports June 5
- Reviews will be completed by the end of June
  - Regional Coordinators
  - NFHP Board
- Regional directors and headquarter reviews in July
- Funding out to USFWS offices in August – grant agreements
- Hoping to get operational funding approved and out sooner!

National Fish Habitat Conservation Through Partnerships Act (2019 – 2023)

Rep. Rob Wittman (R-VA) and Rep. Marc Veasey (D-TX) in the House, and Senator Mike Crapo (R-ID) and Senator Benjamin Cardin (D-MD) introduced these bipartisan bills on March 12, 2019.

- Codifies the existing National Fish Habitat Board and National Fish Habitat Partnership (NFHP)
- Ensures the Board evaluates and recommends projects and partnerships for funding to the Secretary of the Department of the Interior.
- Codifies the established program as a state and locally-led, public-private partnership effort that facilitates a purely voluntary, from "the-ground-up" fish habitat conservation program driven by multiple partners for local and regionally-based fish habitat conservation.
- Codifies self-governing responsibilities and expectations of the partnerships for fish habitat conservation work
- The FWS is the designated agency for grant management of the National Fish Habitat Program, with technical and scientific support for the program provided by other federal agencies including the U.S. Department of Commerce and the U.S. Department of Agriculture.
- The non-federal match requirement for projects is not less than 50%, with the ability for in-kind, donations, and agreements with federal agencies to fulfill projects. The bill codifies NFHP at an authorized funding level of $7.2 million annually. Appropriators would determine on an annual basis how much funding is available to the program, not to exceed $7.2 million. The legislation allows funds for federal agency technical assistance and provides for appropriate Congressional oversight of partnership designations, projects, and use of funds.
- Provides important protections for the following: private property and water rights; state water laws and adjudication of water rights; tribal treaty rights; Department of Commerce authority; and, restrictions on federal acquisitions of water and property rights
- Provides 5 percent of funds annually appropriated for administration of the Act.

National Fish Habitat Conservation Through Partnerships Act

Key Policy Improvements of the Legislation

- Codifies the existing National Fish Habitat Board and National Fish Habitat Partnership (NFHP) to fulfill the vision established in the 2006 National Fish Habitat Action Plan, where strategic implementation of local fish habitat projects, are implemented by regional Fish Habitat Partnerships. Oversight of these efforts are provided by the Board, which is a non-regulatory entity whose membership consists of representatives from state fish and wildlife agencies; federal fish, wildlife and natural resource management agencies; sportsmen's and conservation organizations; and the business community.

- Ensures the Board evaluates and recommends projects and partnerships for funding to the Secretary of the Department of the Interior. Currently, under the existing NFHP, the U.S. Fish and Wildlife Service (FWS) determines project selection and funding awards regardless of Board recommendations. This legislation provides an added layer of transparency and public involvement in project selection, as was originally envisioned by stakeholders involved with the program inception and the 2006 National Fish Habitat Action Plan.

- Codifies the established program as a state and locally-led, public-private partnership effort that facilitates a purely voluntary, from "the-ground-up" fish habitat conservation program driven by multiple partners for local and regionally-based fish habitat conservation.

- Codifies self-governing responsibilities and expectations of the partnerships for fish habitat conservation work and codifies a diverse board membership that includes representation of interests already serving on the Board plus representatives from various industries with an interest in fish and fish habitat conservation. A state fish and wildlife agency representative is designated as the Board Chair.

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- Provides important protections for the following: private property and water rights; state water laws and adjudication of water rights; tribal treaty rights; Department of Commerce authority; and, restrictions on federal acquisitions of water and property rights. Also includes protections of state fish and wildlife agencies' authorities to manage and regulate the fishing or hunting of fish and wildlife.

Provides 5 percent of funds annually appropriated for administration of the Act.

OYSTER REEF RESTORATION IN BACK SOUND, RACHEL CARSON RESERVE, NC

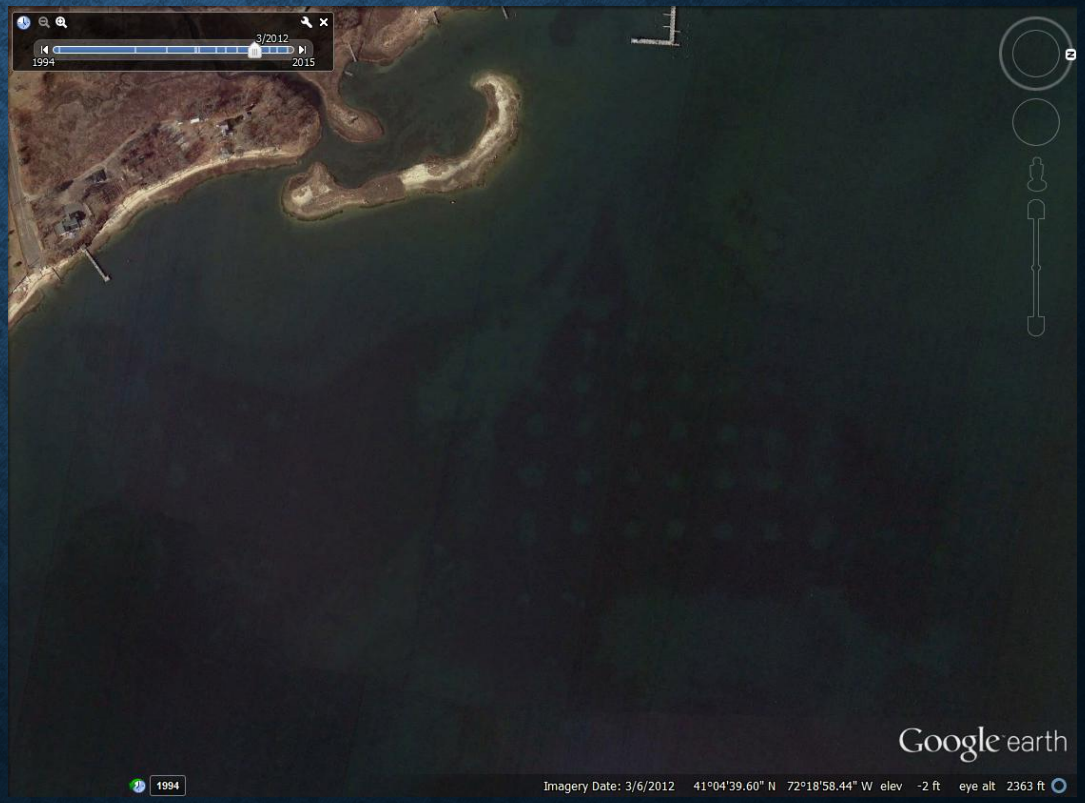
FY18 - $49,833 Total - $123,010

- Restore 0.11 acres of oyster reefs along eroding salt marsh
- Protects an additional 3+ acres of saltmarsh
- Timeframe: 7/18

SEAGRASS CONSERVATION MOORINGS, COECLES HARBOR, NY

FY18 - $17,965 Total - $138,188

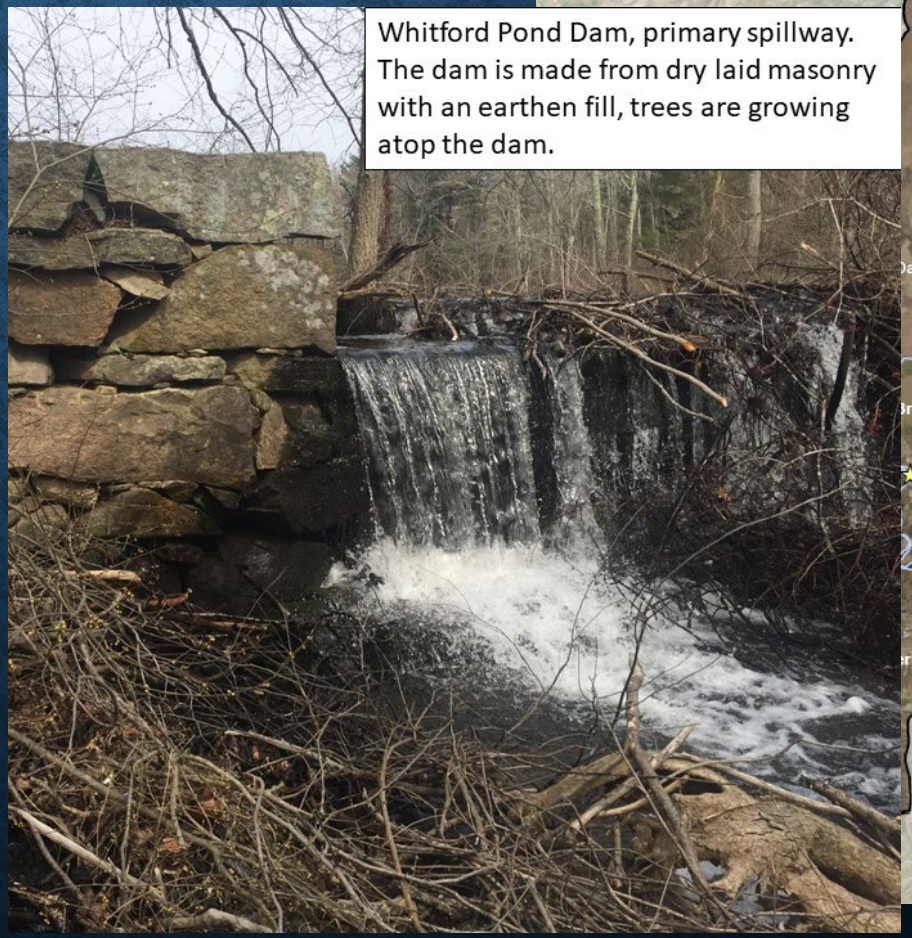
- Replace 6 traditional moorings with conservation moorings to protect seagrass in harbor
- Good visibility to inspire others to use conservation moorings
- Timeframe: 2019?



WHITFORD POND DAM RIVER RESTORATION DESIGN, MYSTIC RIVER, CT

FY18 - $50,000 Total - $321,000

- First barrier on the Mystic River
- 1.2 miles fish passage for diadromous fish
- 26.4 acres of improved habitat
- River restoration with fish passage at two other barriers
  - 9.5 miles of reconnected river/floodplain
- Timeline: 2019 - 2020



Whitford Pond Dam, primary spillway. The dam is made from dry laid masonry with an earthen fill, trees are growing atop the dam.

RESTORATION OF SAV IN THE FRESHWATER AND MESOHALINE REGION OF THE CHESAPEAKE BAY, MD

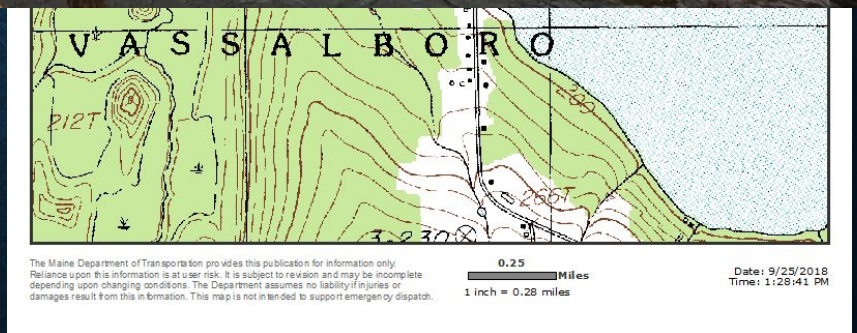
FY18 - $16,895 Total - $46,913

- 10-20 acres of SAV restoration through seed harvest and dispersal
- Timeframe: 2019 - 2020
- Part of Chesapeake Bay Program's goal of 185,000 acres of restoration

FISH PASSAGE, OUTLET STREAM/OUTLET DAM, ME

FY18 - $50,000 Total - $335,027

- Construction phase of a Denil fishway
- Last dam between the ocean (Sebasticook to Kennebec) and China Lake
- 4 other dams either with fish passage or being removed
- nursery habitat for ~800,000 alewives
- Timeline: design will be completed in 2019 and construction in 2020



OLD MILL POND DAM FISH PASSAGE, WRECK POND BROOK, NJ

FY18 - $50,000 Total - $139,718

- Construction of a 60’ long Alaska steep pass fishway
- Opens 0.9 miles of spawning habitat
- Declining number of spawning alewife in Wreck Pond Brook
- Builds on 2013 fish passage project at Wreck Pond (600 foot concrete box culvert)
- Timeline: summer/fall 2019

FINDING THE RIGHT MIX: DEVELOPING BEST PRACTICES FOR CEMENT/OYSTER COMPOSITION ARTIFICIAL REEFS FOR OYSTER AND FISH RECRUITMENT, FL

FY18 - $48,091 Total - $57,525

- Oyster reef structures
  - Cement/oyster coated scaffolding (derelict crab pots)
  - Planting Smooth cord grass, *Spartina alterniflora* behind behind 50%
- 120 meters of shoreline restored
- Timeline: 2019 – monitoring for 2 years

Year	Organization	State	Project Type	NFHAP Amt	Total Project Cost
2018	The Nature Conservancy	NJ	Fish Passage	$50,000	$7,193,000
2018	NY Department of Environmental	NY	Submerged Aquatic	$17,965	$138,188
2018	East Carolina University	NC	Oyster Reef	$49,833	$123,010
2017	Atlantic Salmon Federation	ME	Fish Passage	$25,000	$1,376,600
2017	North Carolina Coastal Federation	NC	Oyster Reef	$27,519	$77,236
2016	The Nature Conservancy	RI	Fish Passage	$35,000	$1,187,650
2015	Town of Surry	ME	Fish Passage	$55,291	$223,161
2015	The Nature Conservancy	MA	Fish Passage	$50,000	$758,363
2015	Cape Fear River Watch	NC	Riverine Bottom	$30,000	$314,511
2014	The Nature Conservancy	NH	Oyster Reef	$40,525	$141,300
2014	North Carolina Coastal Federation	NC	Oyster Reef and Tidal	$24,657	$61,013
2013	University of North Florida	FL	Oyster Reef and Tidal	$31,437	$77,574
2013	Cornell Cooperative Extension	NY	Submerged Aquatic	$27,405	$95,992
2012	MA Division of Marine Fisheries	MA	Submerged Aquatic	$19,172	$63,874
2012	James River Association	VA	Riverine Bottom	$30,240	$189,800
2012	Marine Resources Council	FL	Tidal Vegetation	$50,000	$124,375
2011	SC Department of Natural Resources	SC	Tidal Vegetation	$24,603	$49,620
2011	Great Works Regional Land Trust	ME	Fish Passage	$13,587	$275,000
2010	SC Department of Natural Resources	SC	Fish Passage	$40,000	$70,000
2010	NY Department of Environmental	NY	Fish Passage and Riverine	$30,000	$80,000

Atlantic Coastal Fish Habitat Partnership Update to the NFHP Board

National Fish Habitat Partnership Board Meeting

March 20, 2019

Arlington, VA

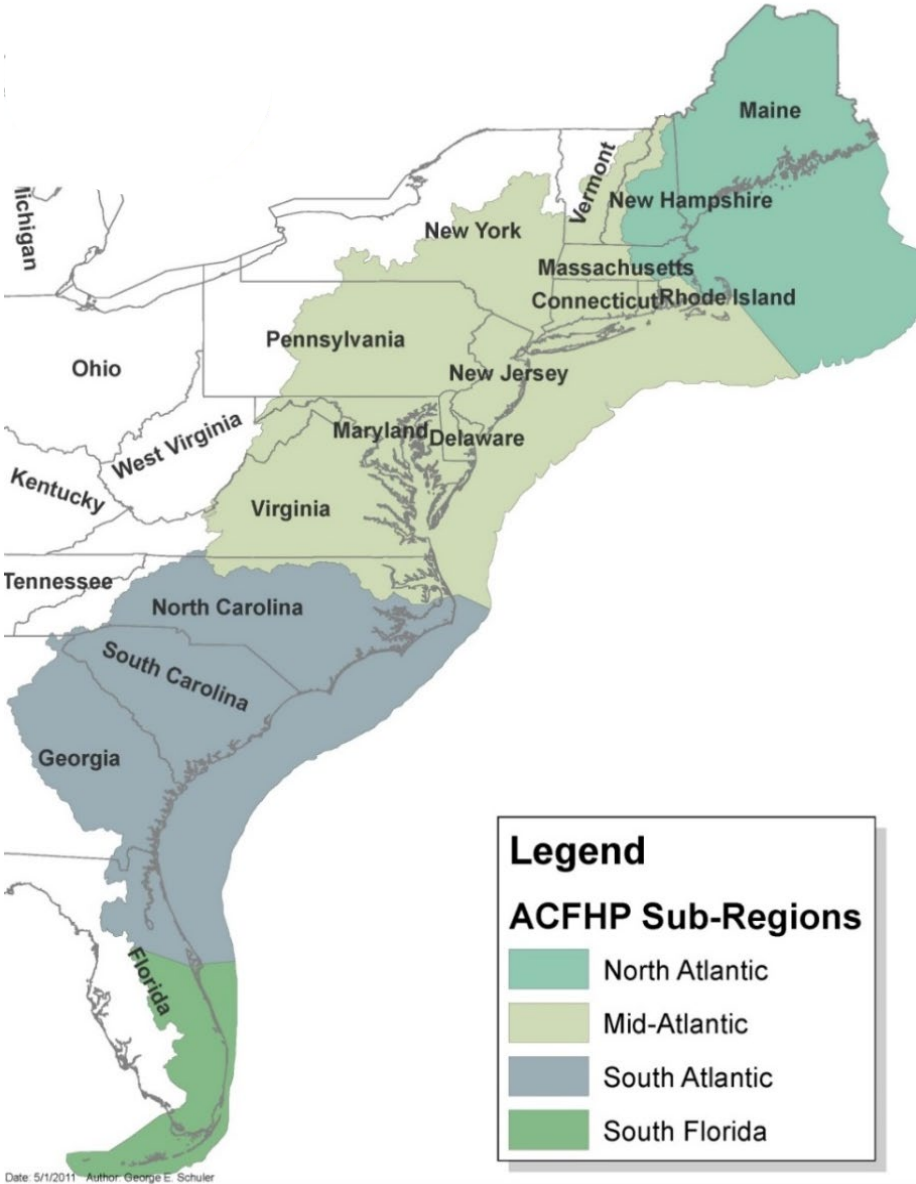
Shutterstock

A Quick Background…

Atlantic Coastal Fish Habitat Partnership

Mission

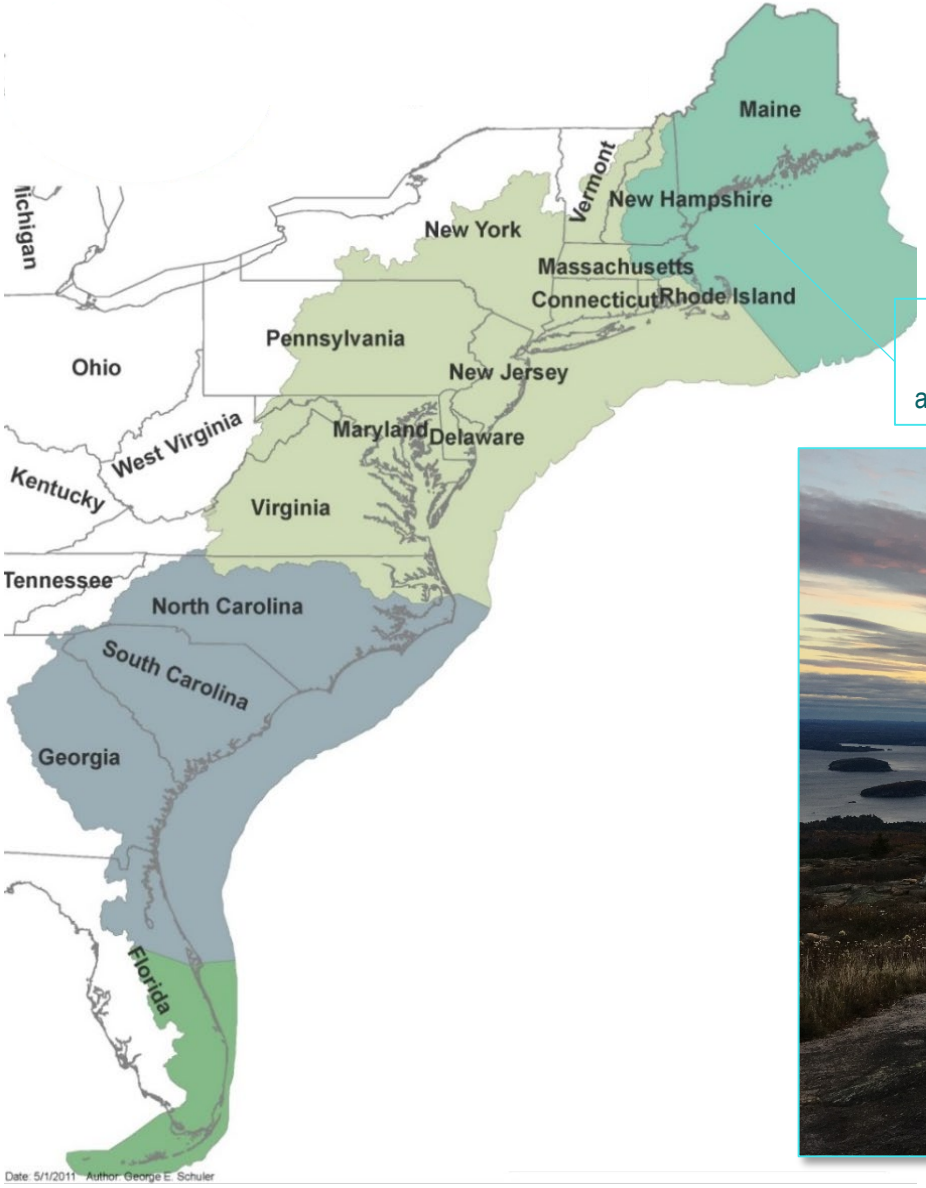
To accelerate the conservation, protection, restoration, and enhancement of habitat for native Atlantic coastal, estuarine-dependent, and diadromous fishes through partnerships between federal, tribal, state, local, and other entities



A Quick Background…

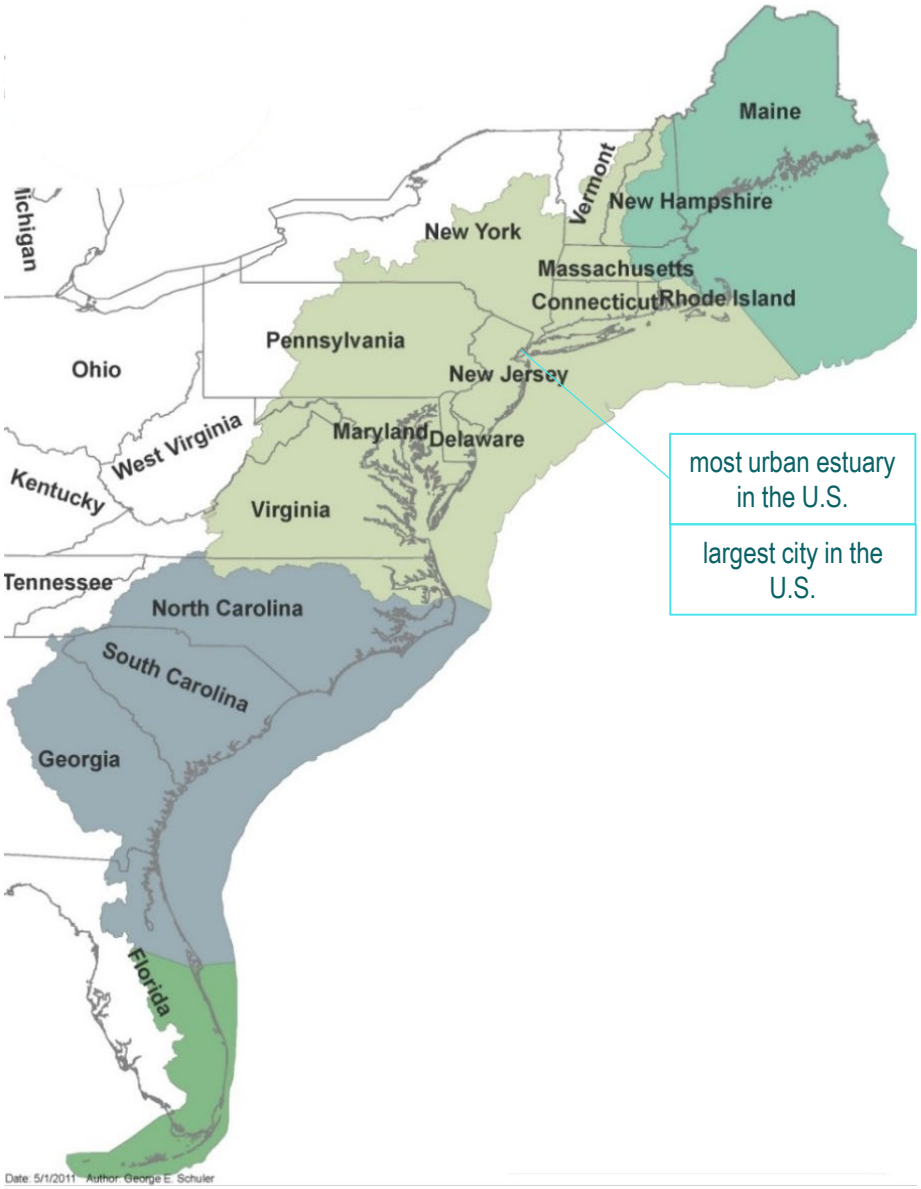
- over 25% of the U.S. population
- 9 of the 10 most densely populated states
- cold temperate to tropical Atlantic waters
- 4 national marine sanctuaries and 1 national monument

A Quick Background…



one of the most rapidly warming areas on the planet

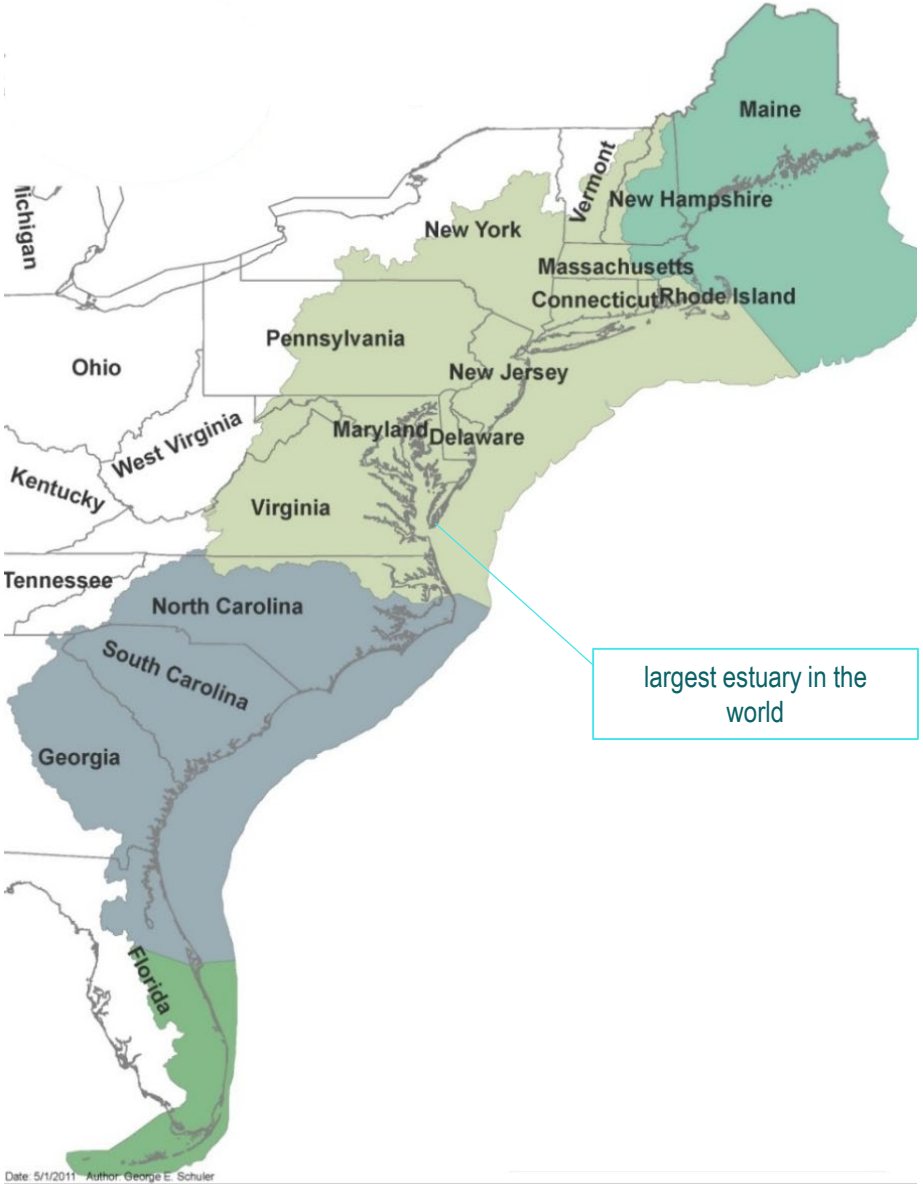
A Quick Background…



most urban estuary in the U.S.

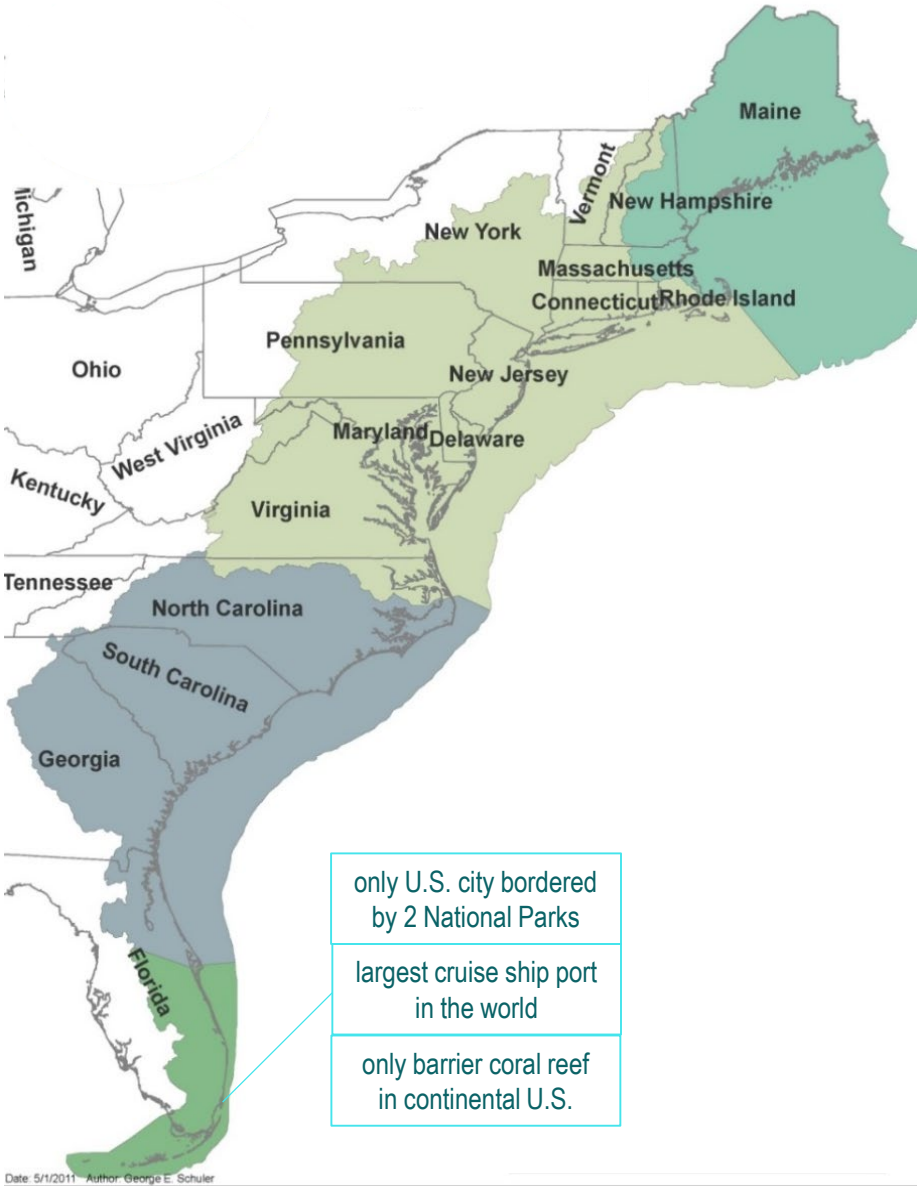
largest city in the U.S.

A Quick Background…



largest estuary in the world

A Quick Background…



- only U.S. city bordered by 2 National Parks
- largest cruise ship port in the world
- only barrier coral reef in continental U.S.

A Quick Background…

Making the Connection

From the headwaters to the continental shelf

Between fish and people

Among partners

Our Partners

Priority Habitats

North Atlantic

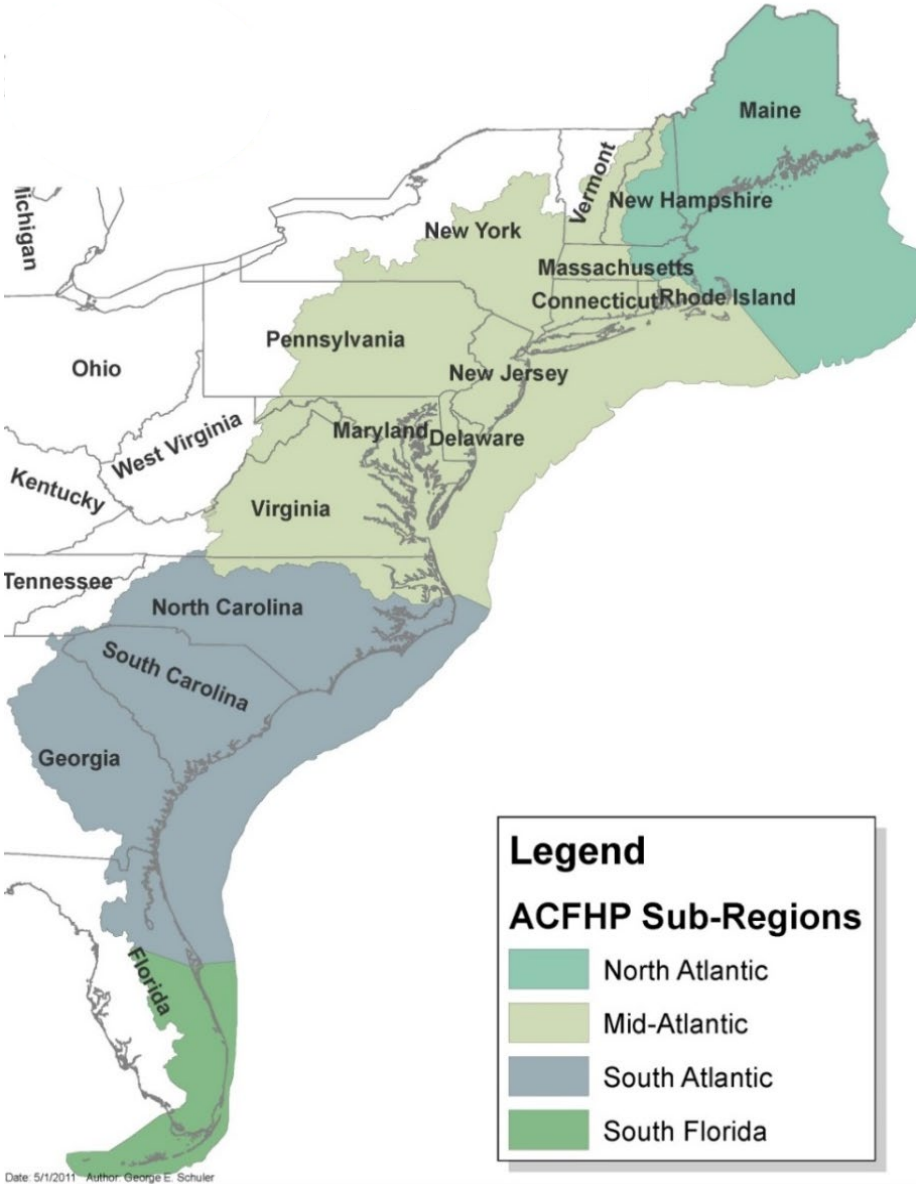
- Riverine bottom
- Shellfish beds
- SAV

Mid- & South Atlantic

- Riverine bottom
- Shellfish beds
- SAV
- Tidal vegetation

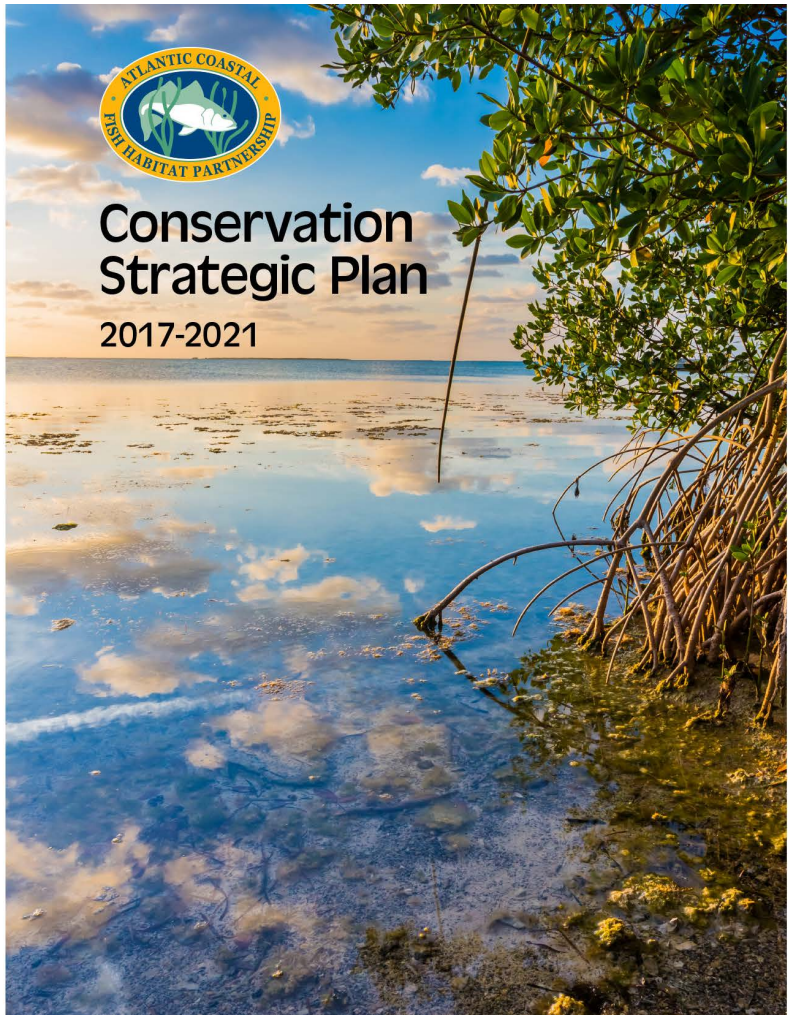
South Florida

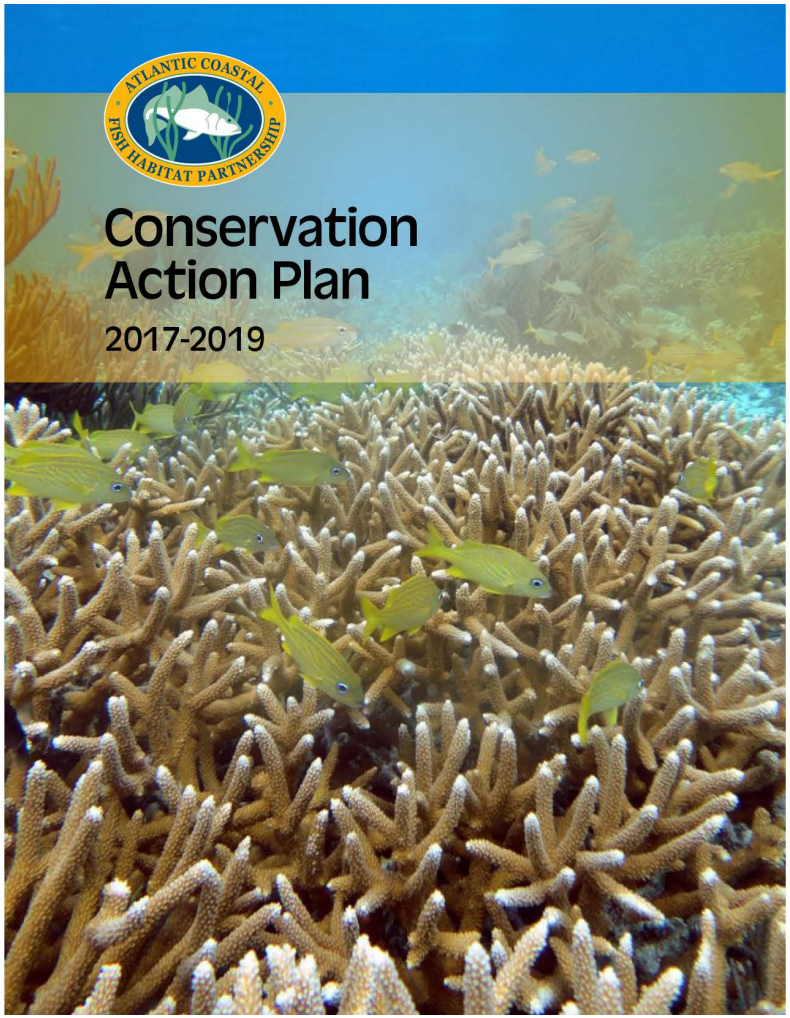
- SAV
- Tidal vegetation
- Coral and live/hard bottom



Guidance Documents

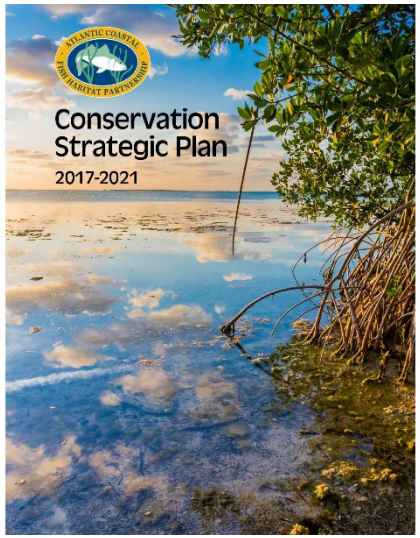
Guiding Documents





Guidance Documents

Conservation Strategic Plan

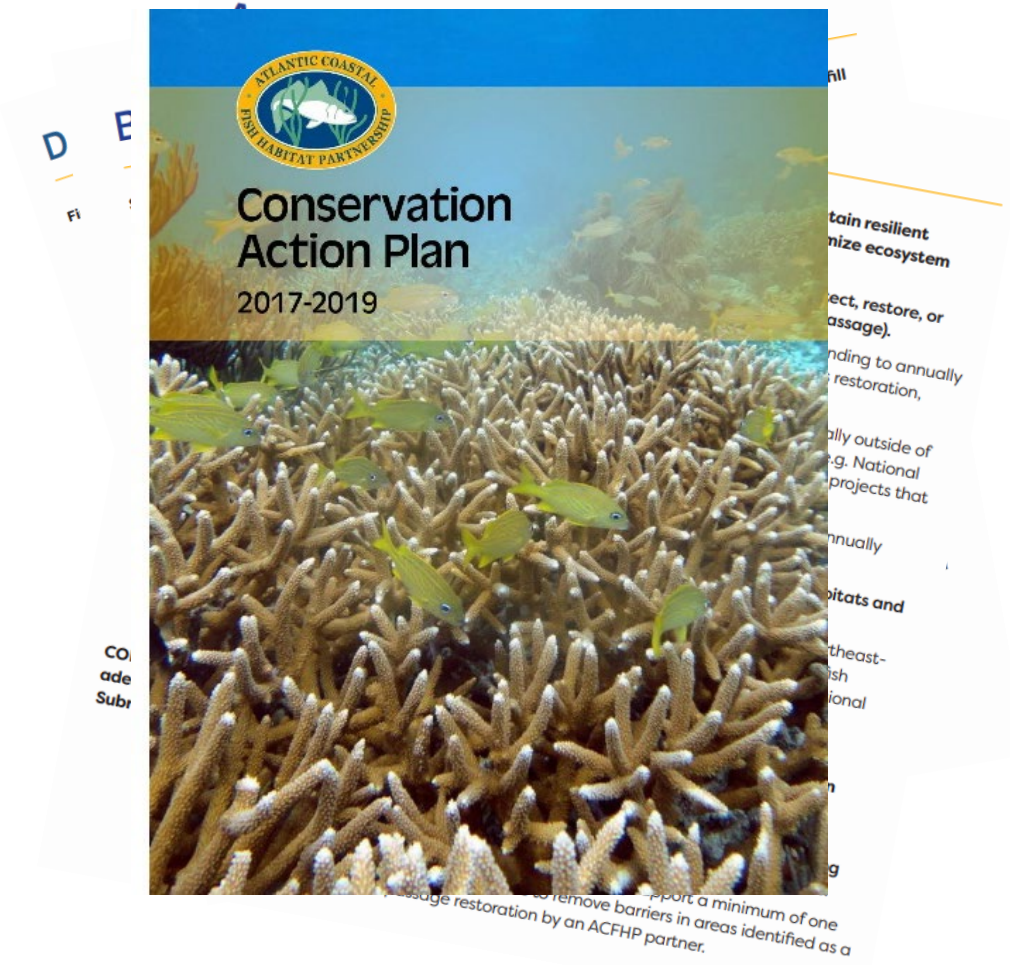


- Background information
- Habitats
- Habitat Threats
- Conservation Objectives
- Science & Data Objectives
- Outreach & Comm Objectives
- Finance Objectives

Guidance Documents

Conservation Action Plan

- Objectives
- Strategies
- Actions



Outreach and Communication

Melissa Laser Fish Habitat Conservation Award

- 2018 – Eric Anderson, Palm Beach County Department of Environmental Resources Management
- 2017 – Jeff Beal, FL Fish and Wildlife Conservation Commission
- 2016 – Bonnie Bick and Jim Long, Mattawoman Watershed Society
- 2015 – Deb Wilson, Nobleboro, ME Fish Habitat Activist

The Usual Suspects

- Facebook posts
- Newsletters
  - ~9 – 12 per year via email
  - ASMFC's *Habitat Hotline Atlantic*
  - Coastal FHP newsletters

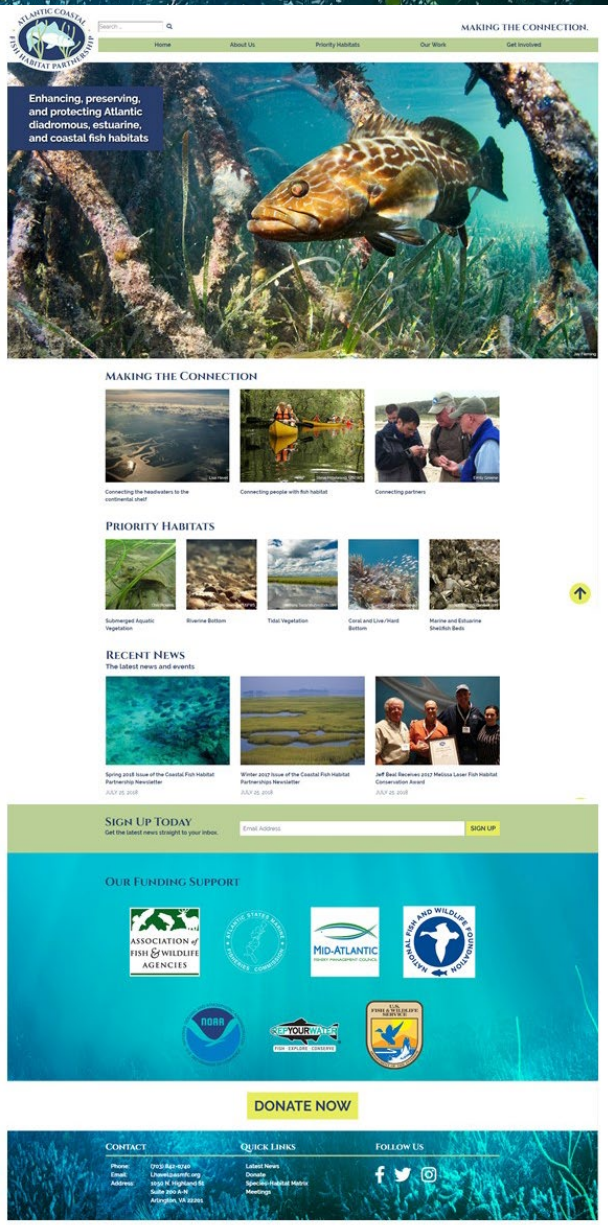
Outreach and Communication

The Usual Suspects

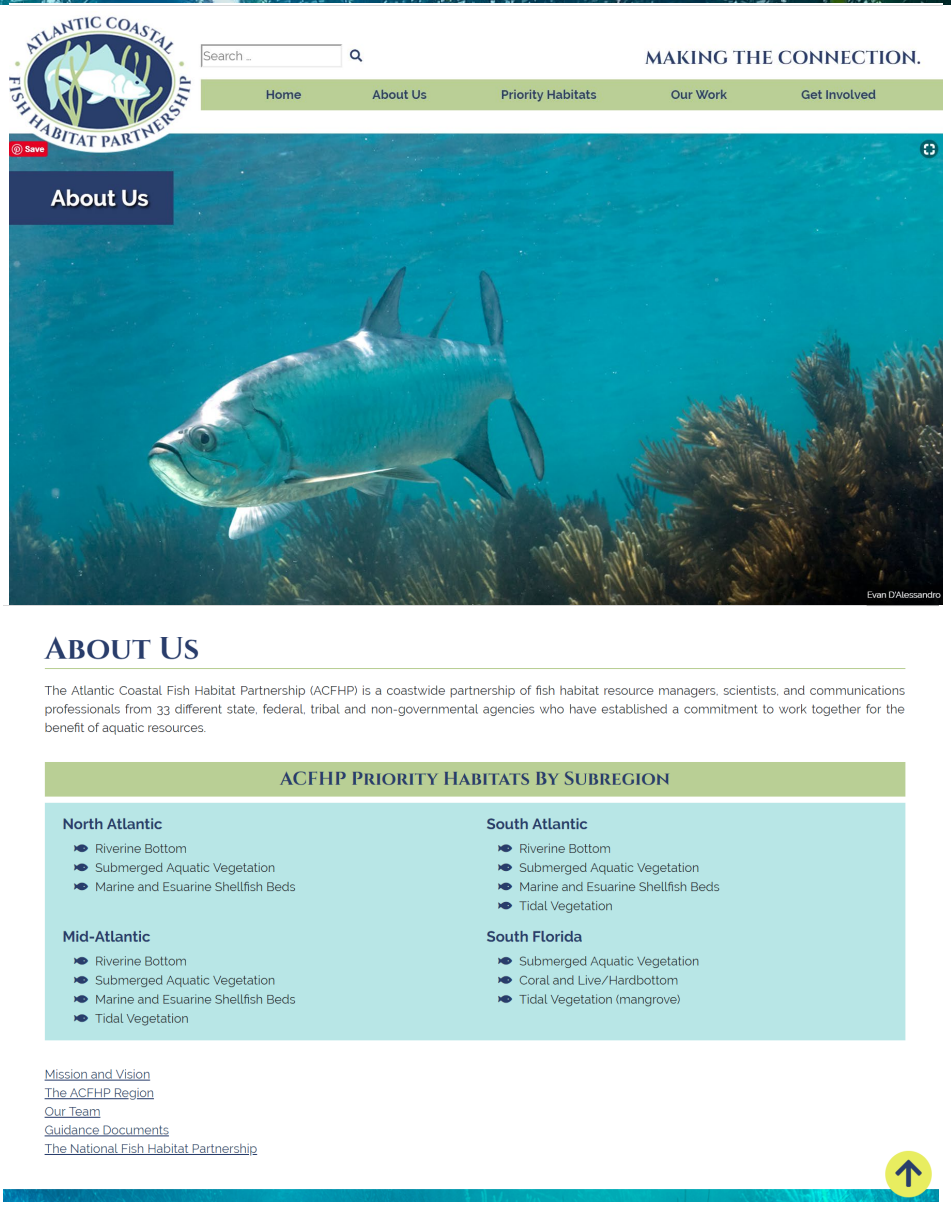
- Conferences
  - American Fisheries Society
  - Restore America's Estuaries/The Coastal Society Summits
  - New England Saltwater Fishing Show
- Meetings
  - ASMFC Policy Board/Habitat Committee/Artificial Reefs Committee
  - Chesapeake Bay River Herring Workshops
  - Chesapeake Bay Program GIT
  - South Atlantic Council Habitat AP

Outreach and Communication

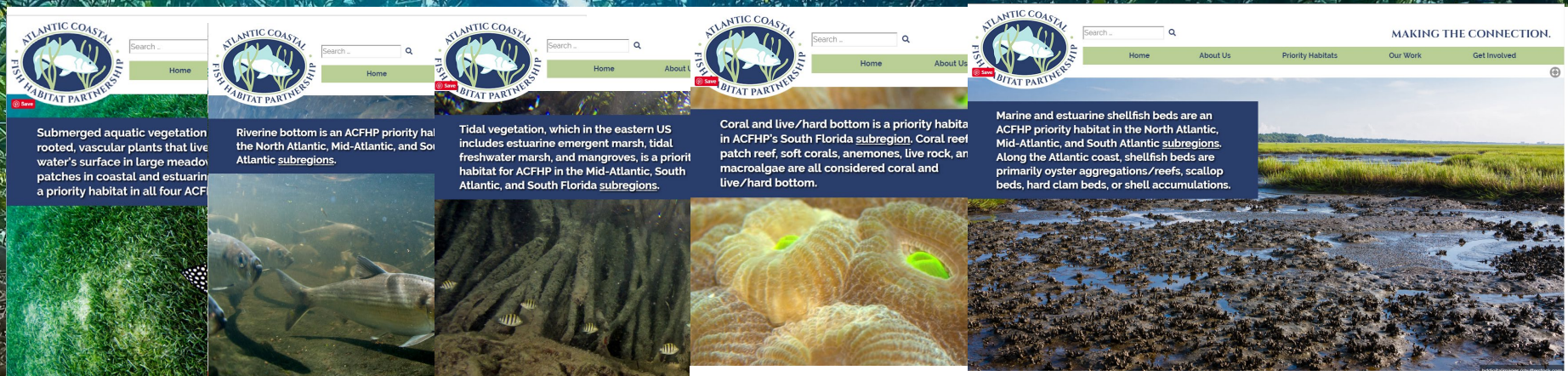
New Website



Outreach and Communication



Outreach and Communication



Submerged Aqu

SAV on the Atlantic Coas

Tidal fresh and oligohaline plant species are
wild celery and *Ceratophyllum demersum*, co

Mesohaline and polyhaline plant species are
and *Ruppia maritima*, widgeon grass.

Why SAV is Important

Through photosynthesis, SAV removes excer
worldwide. This is only 0.2% of the ocean flo
effective at storing carbon than terrestrial fore

SAV roots also stabilize sediments and absorl
communities, but coastal property owners a
Overall, SAV contributes to healthy fisheries a

Unfortunately, SAV is one of the most rapidly

Threats to SAV

ACFHP has determined the following are the

Riverine Bottom

Riverine Bottom on the Atlantic Co

Riverine bottom habitat includes the benthos of higher gradie
mainstem rivers, and low order coastal streams. It also includes
marsh. Riverine bottom is an ACFHP **priority habitat** in the North

Why Riverine Bottom is Important

Riverine bottoms act as spawning and nursing grounds for ma
species migrate many miles upstream to spawn in calmer, safe
life stages to mature before migrating downstream to marine er
as food sources for many fish species.

Rivers transport freshwater to marine ecosystems, connecting
ecosystems that rely on it. They also create a wide variety of hab

Despite its importance, more than 80% of riverine habitat is inacc
current diadromous populations are only a mere 1% of historical l

Threats to Riverine Bottom

ACFHP has determined the following are the greatest threats to

- Obst
- Dred
- Wate
- Cons
- Sedi
- Cont
- Inva
- Clim

Tidal Vegetation

Tidal Vegetation on the Atlantic C

Estuarine emergent salt marsh is an environment in the coas
daily, while the high marsh floods only during storms and
flooded low marsh along much of the Atlantic coast. In additio
(*Juncus* spp.) species comprise much of the vegetative commu

Tidal freshwater marsh occurs where the average annual sal
upstream of the salt front, where the river essentially backs up
These include: giant cordgrass (*Spartina cynosuroides*), sa
pickerelweed (*Pontederia cordata*), blue flag (*Iris virginica*), and

The mangrove ecological community includes four tree sp
supratidal shorelines in southern Florida. The four species fou
(*Avicennia germinans*), white mangrove (*Laguncularia racemos*

Why Tidal Vegetation is Important

Tidal vegetation provides a wide variety of benefits to both
species use these areas as nursing and spawning habitat. Th
Tidal vegetation sequesters carbon at a rate 2 – 4 times gre
mitigate climate change.

Tidal vegetation provides key ecosystem services, such as pr
habitat for marine species. these areas also help to suppo
contribute $1.6 billion in ecosystem services each year to the U

Unfortunately, these areas are also facing significant threats, a
to 2009, a trend that is reflected on a global scale as well.[2]

Threats to Tidal Vegetation

- Dredg
- Water
- Sedim
- Vesse
- Invas
- Conta
- Climat

Coral and Live/Hard

Coral and Live/Hard Bottom on the

Reef-building corals are of the order Scleractinia. Coral accumula
exceeds 18 °C (64 °F) throughout the year. Through symbiosis wi
communities. A patch reef is an isolated, often circular, coral reef

Soft corals are species of the anthozoan order Alcyonacea. In co
skeleton (e.g. sea pens and sea fans). Anemones are cnidarians
surrounded by tentacles. They are found in soft sediments.

Live rock is calcareous rock that is spatially removed from the v
bacteria, coralline algae, sponges, worms, crustaceans, and other

Macroalgae are large marine multi-cellular macroscopic algae (se
ranging from inshore to offshore.

Why Coral Reefs are Important

Known as the rainforests of the sea, coral reefs provide habitat to
to their ecological benefits, they protect coastal communities ag
sources of medicine.

As a tourist attraction for fishers and divers, the coral reef tract i
responsible for supporting over 61,000 full and part-time jobs.[2]

Florida's coral reefs, however, are dissolving at a faster rate than
showed up only in 2014.[3]

Threats to Coral and Live/Hard Bot

ACFHP has determined the following are the greatest threats to c

- Dredging and coasta
- Water quality degrad
- Vessel operation imp
- Contamination of wa
- Invasive species and
- Climate change

Marine and Estuarine Shellfish Beds

Marine and Estuarine Shellfish Beds on the Atlantic Coast

Oyster aggregations and reefs are structures formed by the Eastern oyster (*Crassostrea virginica*) that provide the dominant structural component of the benthos, and whose accumulated mass provides significant vertical relief (> 0.5 m).

Scallop beds are areas of dense aggregations of scallops on the ocean floor. Common Atlantic coast species include: (1) the large Atlantic scallop (*Placopecten magellanicus*), which ranges from Newfoundland to North Carolina; and (2) the medium-sized Atlantic calico scallop (*Argopecten irradians*), which occurs from Cape Cod to Florida, as well as in the Gulf of Mexico.

Hard clam beds are dense aggregations of hard clam (*Mercenaria mercenaria*) found in the subtidal regions of bays and estuaries to approximately 15 m in depth. Clams are generally found in mud flats and firm bottom areas consisting of sand or shell fragments.

Shells of dead mollusks sometimes accumulate in sufficient quantities to provide important habitat as well. Accumulations of Eastern oyster shells are a common feature in the intertidal zones of many southern estuaries.

Why Marine and Estuarine Shellfish Beds are Important

Shellfish serve a variety of functions, benefitting both the ecosystem and people alike. They are great for improving water quality. Did you know that a single oyster is capable of filtering 50 gallons of water each day? By doing so, they remove excess nutrients, contaminants, and suspended sediments from the water column.

Shellfish also provide habitat and food for estuarine species. Their structure is especially important for nursery species in need of shelter from larger predators. Their sturdy reefs stabilize the sediments and reduce the threat of coastal erosion. For this reason, they are great buffers against storm surge, which is an ever-increasing threat along the Atlantic coast as sea levels rise and storms intensify.

Shellfish, and especially oysters, also contribute millions of dollars to the East Coast's economy. Some even say New York City was built on oysters. They have been a staple food source on the Atlantic coast since before Europeans arrived, and are still considered a delicacy today.

Despite their importance, oyster reefs are on the decline. According to The Nature Conservancy, 85% have been lost globally, making them the most severely impacted habitat on the planet. In the Chesapeake Bay alone, coverage is less than 1% of historic mass.[1]

Threats to Marine and Estuarine Shellfish Beds

ACFHP has determined the following are the greatest threats to marine and estuarine shellfish beds in at least one subregion:

- Water quality degradation and eutrophication
- Sedimentation
- Dredging and coastal maintenance
- Consumptive water withdrawal
- Invasive species and disease
- Vessel operation impacts
- Contamination of water and sediments
- Climate change

Our Submerged Aquatic Vegeta

On the Ground Projects

Conservation moorings (funded), Massachusetts
Conservation moorings (endorsed), Massachusetts
Conservation moorings, Rhode Island
Peconic Estuary, New York
Coecles Harbor, New York
Tarpon Cove, Florida
Grassy Flats, Florida

Our Riverine Work

On the Ground Projects

Patten Stream, Maine
Sheepscot River, Maine
Shorey's Brook, Maine
Exeter Dam, New Hampshire
Wynantis Kill, New York
Cotton Gin Mill Dam, Massachusetts
Bradford Dam, Rhode Island
Scoy Pond, New York
West River, Connecticut
Columbia Dam, New Jersey
James River, Virginia
Cape Fear River, North Carolina
Goose Creek, South Carolina
Long Branch Creek, South Carolina

Our Tidal Vegetation Work

On the Ground Projects

North River Farms, North Carolina
Back Sound, North Carolina
Bogue Sound, North Carolina
Stump Sound, North Carolina
Long Branch Creek, South Carolina
Intracoastal Waterway, South Carolina
Guana Peninsula, Florida
Dragline Ditched Restoration, Florida
Indian River Lagoon, Florida
Tarpon Cove, Florida
Grassy Flats, Florida

Our Coral and Live/Hard Bottom Work

Science & Data Projects

Species-Habitat Matrix
Assessment of Existing Information

Our Shellfish Bed Work

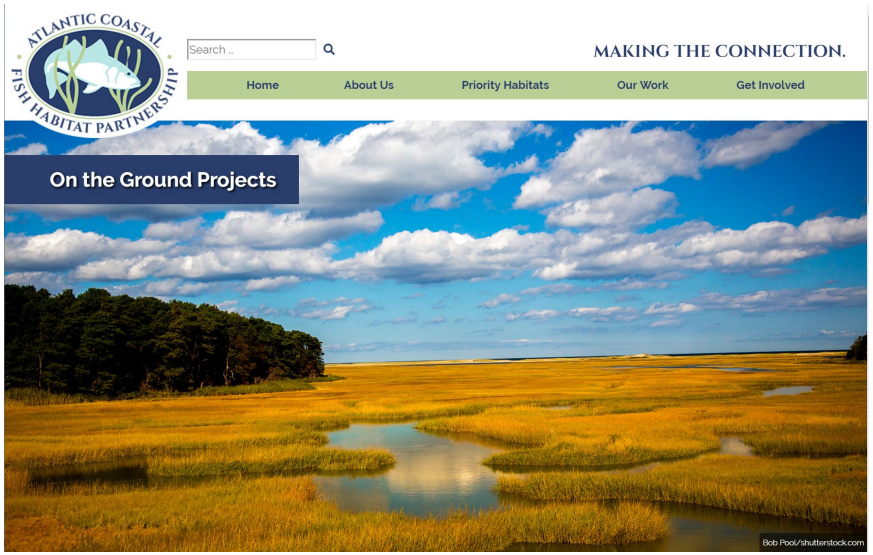
On the Ground Projects

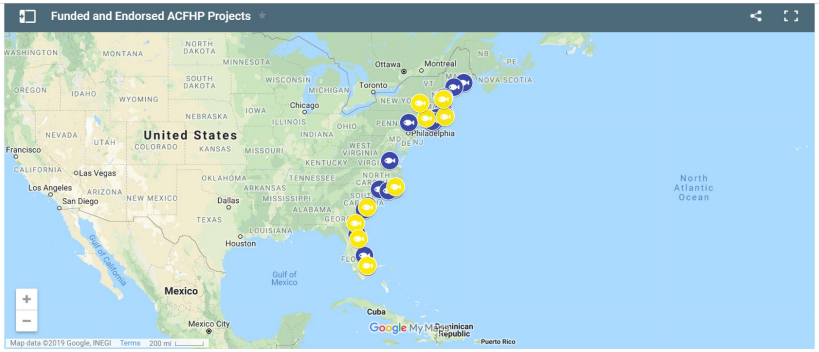
Great Bay Estuary, New Hampshire
North River Farms, North Carolina
Back Sound, North Carolina
Bogue Sound, North Carolina
Stump Sound, North Carolina
Intracoastal Waterway, South Carolina
Back River Bridge, Georgia
Guana Peninsula, Florida
Tarpon Cove, Florida
Grassy Flats, Florida

Science & Data Projects

Species-Habitat Matrix
Assessment of Existing Information

Outreach and Communication





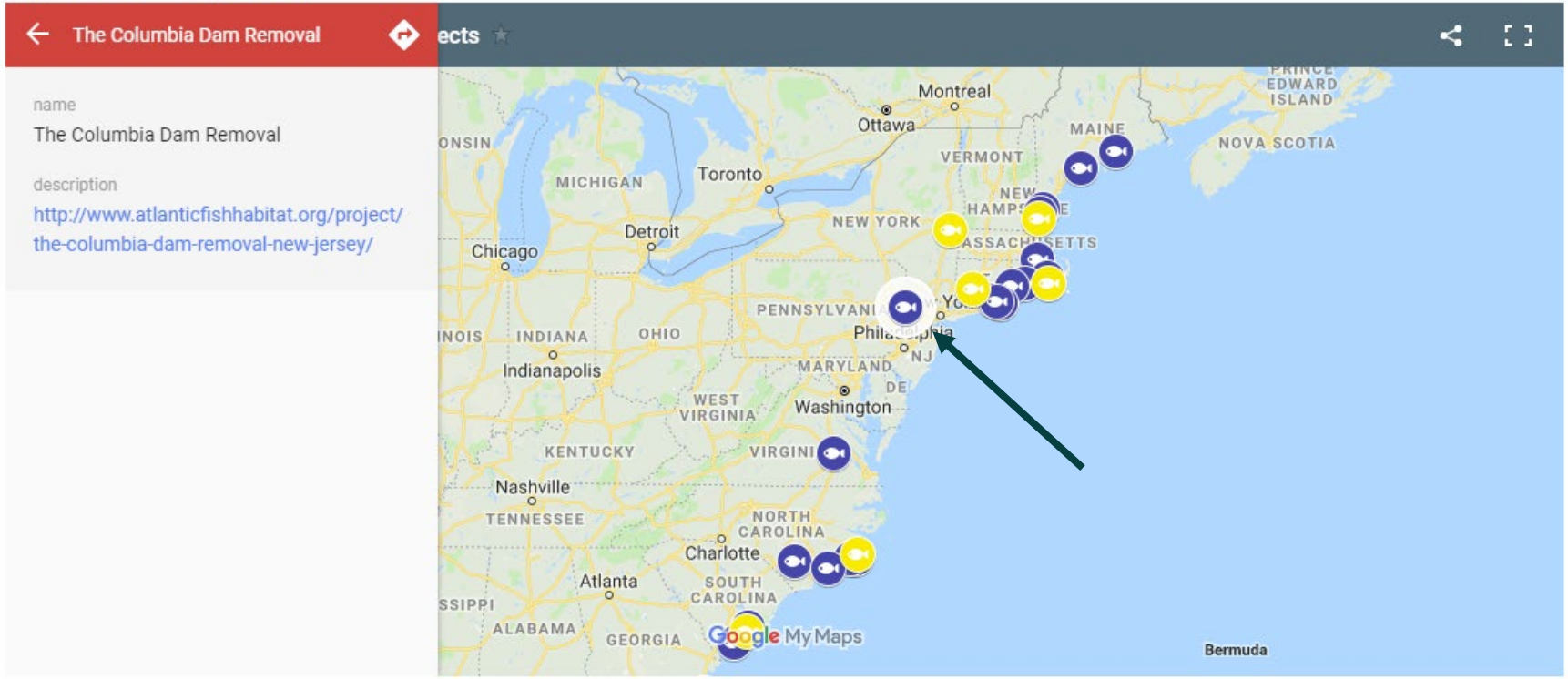
Partners We've Funded

- The Nature Conservancy
- NY Department of Environmental Conservation
- East Carolina University
- Atlantic Salmon Federation
- North Carolina Coastal Federation
- Town of Surry, Maine
- Cape Fear River Watch
- University of North Florida
- Cornell Cooperative Extension
- MA Division of Marine Fisheries
- James River Association
- Marine Resources Council
- SC Department of Natural Resources
- Great Works Regional Land Trust

Outreach and Communication

On the Ground Projects

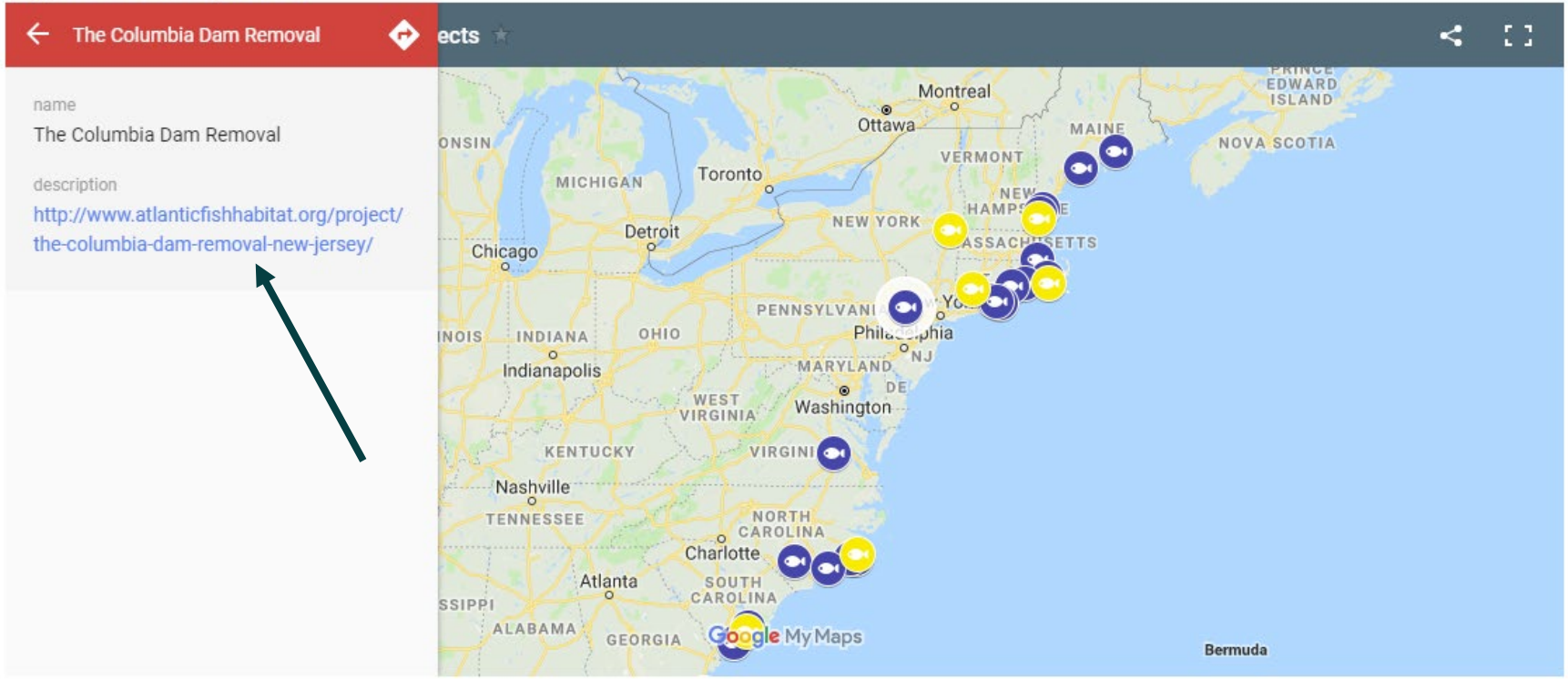
Click on a fish to learn more about a particular conservation project. Purple icons represent ACFHP-funded projects, and yellow icons represent projects endorsed by ACFHP.



Outreach and Communication

On the Ground Projects

Click on a fish to learn more about a particular conservation project. Purple icons represent ACFHP-funded projects, and yellow icons represent projects endorsed by ACFHP.



Outreach and Communication

Atlantic Coastal Fish Habitat Partnership

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The Columbia Dam Removal, New Jersey

click photo to view photo gallery

Knowlton Township, New Jersey

Funded in FY2018 through the National Fish Habitat Action Plan.

The Nature Conservancy is working with partners to remove the Columbia Dam on the Paulins Kill. This project will open approximately 20 miles of streams to migratory fish, including American shad, river herring, sea lamprey, and American eel. It will also improve in-stream habitat for resident fishes and macroinvertebrates, and improve water quality in the former impoundment. The Columbia Dam is located less than 0.25 miles upstream of the confluence with the Delaware River, and is currently a complete barrier to fish passage.

Columbia Dam Removal Factsheet

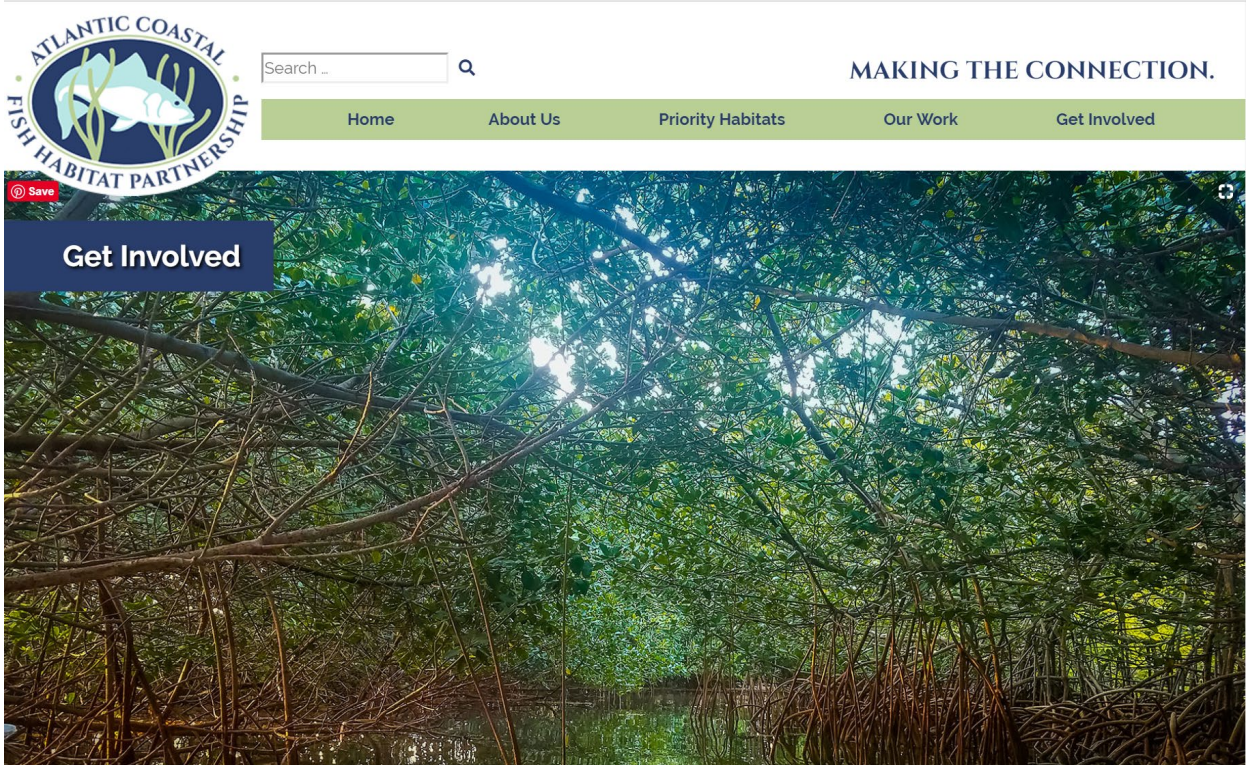
NJ Department of Environmental Protection Columbia Dam Removal factsheet

Text and photos provided by The Nature Conservancy.

Press Articles

- Princeton Hydro summer 2018 article
- Princeton Hydro summer 2018 article #2
- New Jersey Herald winter 2018 article
- WFMZ 69 News summer 2018 article
- New Jersey DEP summer 2018 press release

Outreach and Communication



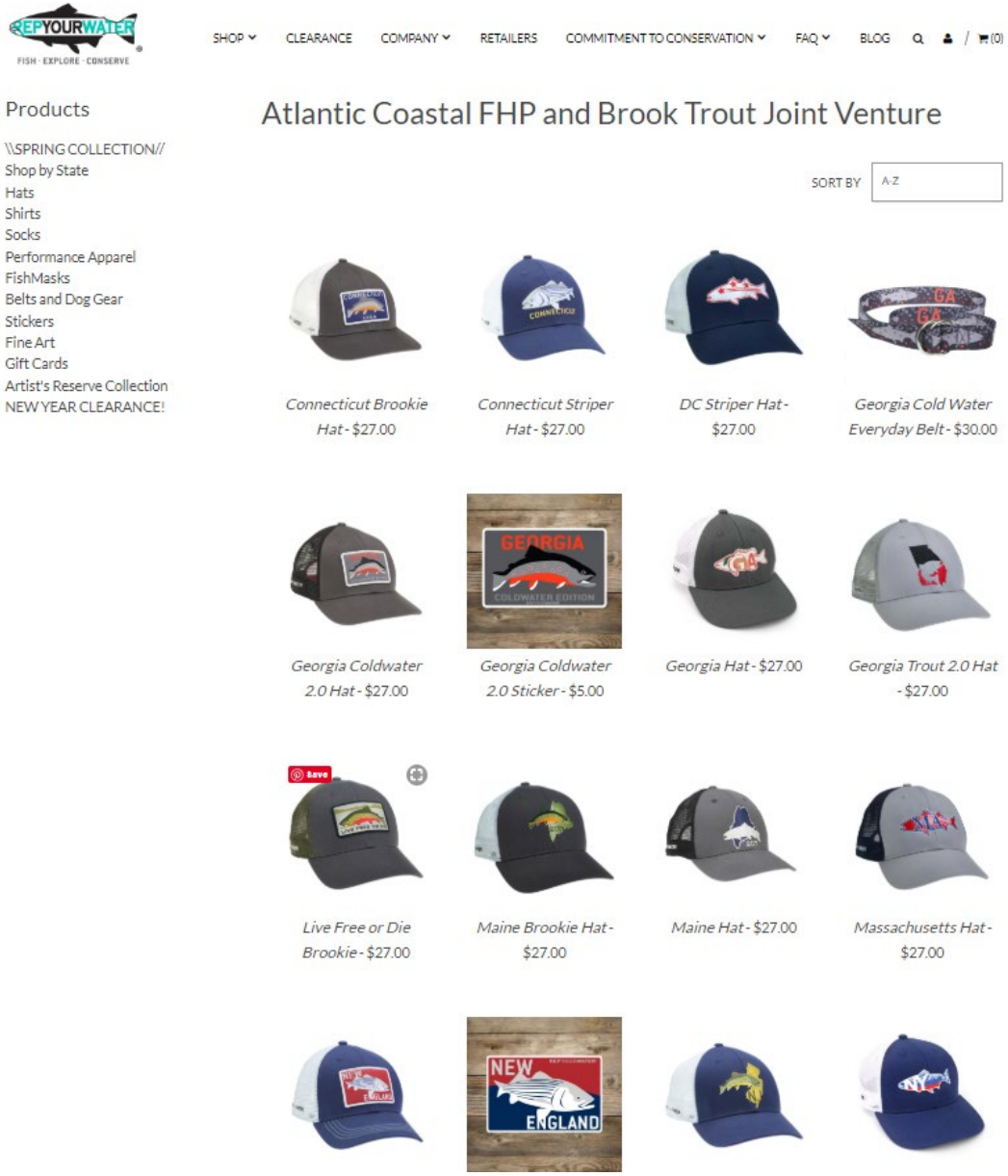
Get Involved

There are a variety of ways to help us achieve our mission. If you're interested in conserving fish habitat along the Atlantic coast, see below for ways you can make a difference!

Meetings
Donate
Stay in Touch
Funding Opportunities
Project Endorsement
Melissa Laser Fish Habitat Conservation Award
Join Us

Outreach and Communication

Outreach and Communication



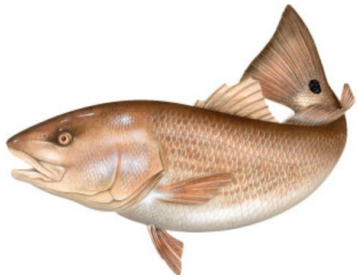
Species-Habitat Matrix Tool

- A tool for evaluating the relative importance of a specific habitat type to a given life history stage for an individual species

- Assess importance of habitat in terms of:
  - Shelter
  - Direct trophic links
  - Spawning
  - Nurseries

Science and Data

- 131 different species across four regions
  - All ASMFC-managed species
  - All Council-managed species
  - All other native diadromous species
  - Select state-managed and unmanaged species
  - Not included: bivalves and species without a marine or estuarine life stage



Science and Data

- Life stages
  - Eggs – Larvae
  - Juvenile/Young of Year (YOY)
  - Adults
  - Spawning Adults
    - Only if fundamentally different from adult, non-spawning habitat

Science and Data

Habitats

- Marine & estuarine shellfish beds
  - oyster aggregations/reef
  - Dead shell accumulations
  - Scallop beds
  - Hard clam beds

Science and Data

Habitats

- Coral and live/hard bottom
  - Coral reefs
  - Patch reef, soft corals, or anemone
  - Live rock

Science and Data

Habitats

- Macroalgae
  - *Fucus* spp.
  - *Laminaria* spp.
  - *Ulva lactuca*

Science and Data

Habitats

- Submerged aquatic vegetation
  - Tidal fresh & oligohaline spp.
  - Mesohaline & polyhaline spp.

Science and Data

Habitats

- Tidal vegetation
  - Estuarine emergent marsh
  - Tidal freshwater marsh
  - Mangrove

Habitats

- Unvegetated coastal bottom
  - Loose fine bottom
  - Loose coarse bottom
  - Firm hard bottom
  - Structured sand habitat

Science and Data

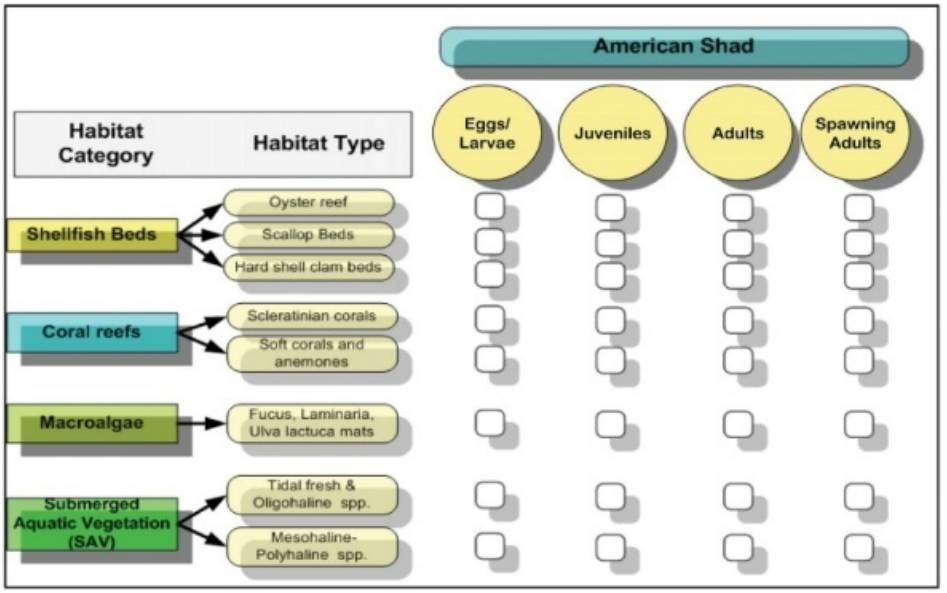
Habitats

- Riverine bottom
  - Higher gradient headwater tributaries
  - Lower gradient tributaries
  - Higher gradient large mainstem rivers
  - Lower gradient large mainstem rivers
  - Low order coastal streams
  - Non-tidal freshwater mussel beds
  - Coastal headwater ponds
  - Non-tidal freshwater marsh

Scoring and analysis

Ranks:

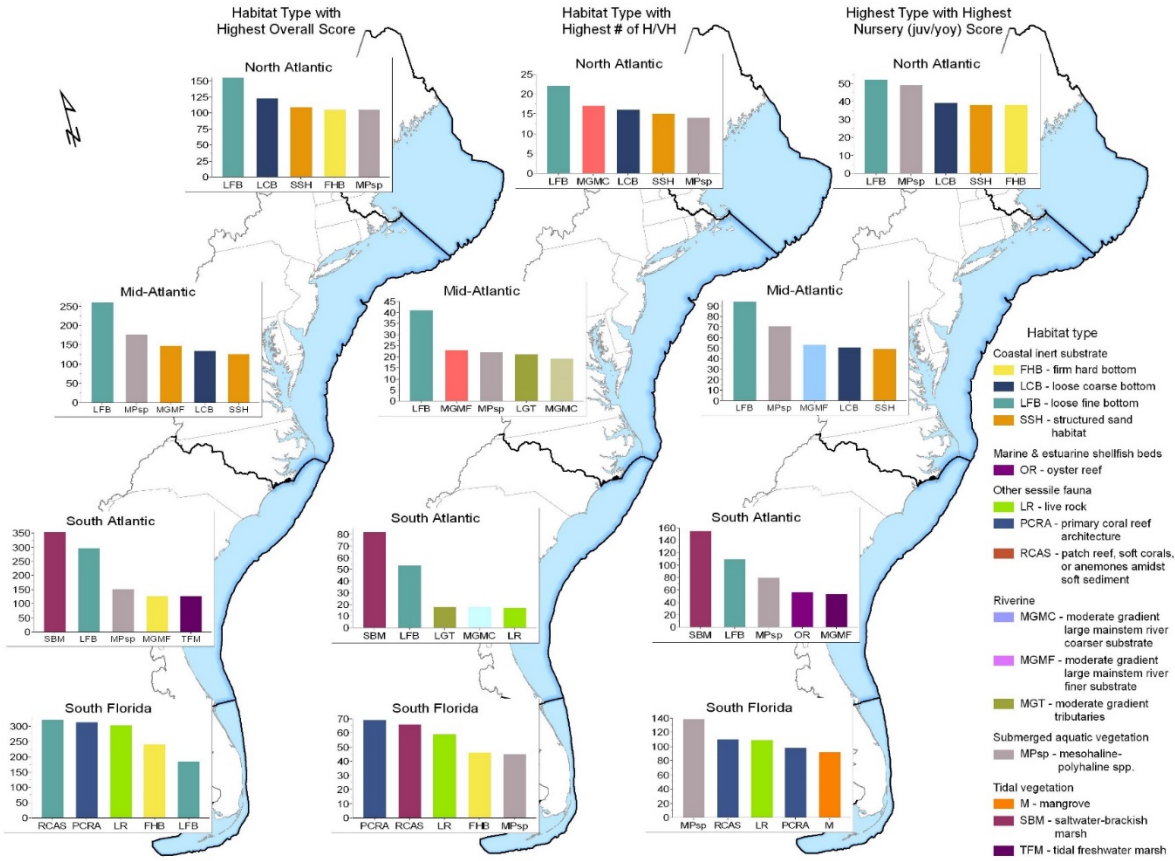
- Very high (4): essential contributor
- High (3.5): primary habitat
- Moderate (2): 1 of many habitats used
- Low (1): used incidentally
- Unknown (to science)
- Blank: not present



Science and Data

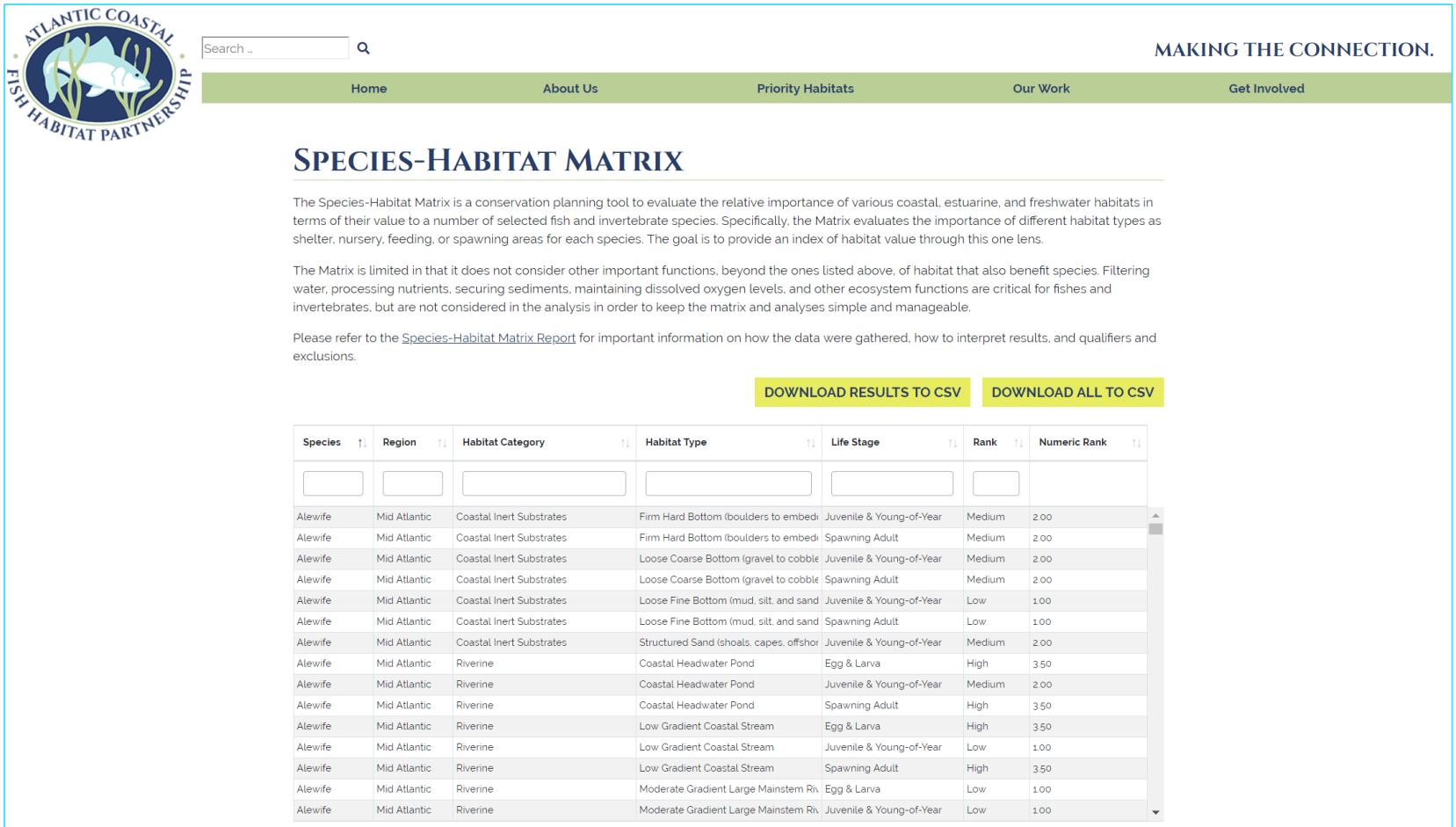
Publication

- *BioScience* April 2016
- Kritzer et al.



Science and Data

Online Query Database



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SPECIES-HABITAT MATRIX

The Species-Habitat Matrix is a conservation planning tool to evaluate the relative importance of various coastal, estuarine, and freshwater habitats in terms of their value to a number of selected fish and invertebrate species. Specifically, the Matrix evaluates the importance of different habitat types as shelter, nursery, feeding, or spawning areas for each species. The goal is to provide an index of habitat value through this one lens.

The Matrix is limited in that it does not consider other important functions, beyond the ones listed above, of habitat that also benefit species. Filtering water, processing nutrients, securing sediments, maintaining dissolved oxygen levels, and other ecosystem functions are critical for fishes and invertebrates, but are not considered in the analysis in order to keep the matrix and analyses simple and manageable.

Please refer to the Species-Habitat Matrix Report for important information on how the data were gathered, how to interpret results, and qualifiers and exclusions.

DOWNLOAD RESULTS TO CSV | DOWNLOAD ALL TO CSV

Species	Region	Habitat Category	Habitat Type	Life Stage	Rank	Numeric Rank
Alewife	Mid Atlantic	Coastal Inert Substrates	Firm Hard Bottom (boulders to embed	Juvenile & Young-of-Year	Medium	2.00
Alewife	Mid Atlantic	Coastal Inert Substrates	Firm Hard Bottom (boulders to embed	Spawning Adult	Medium	2.00
Alewife	Mid Atlantic	Coastal Inert Substrates	Loose Coarse Bottom (gravel to cobble	Juvenile & Young-of-Year	Medium	2.00
Alewife	Mid Atlantic	Coastal Inert Substrates	Loose Coarse Bottom (gravel to cobble	Spawning Adult	Medium	2.00
Alewife	Mid Atlantic	Coastal Inert Substrates	Loose Fine Bottom (mud, silt, and sand	Juvenile & Young-of-Year	Low	1.00
Alewife	Mid Atlantic	Coastal Inert Substrates	Loose Fine Bottom (mud, silt, and sand	Spawning Adult	Low	1.00
Alewife	Mid Atlantic	Coastal Inert Substrates	Structured Sand (shoals, capes, offshor	Juvenile & Young-of-Year	Medium	2.00
Alewife	Mid Atlantic	Riverine	Coastal Headwater Pond	Egg & Larva	High	3.50
Alewife	Mid Atlantic	Riverine	Coastal Headwater Pond	Juvenile & Young-of-Year	Medium	2.00
Alewife	Mid Atlantic	Riverine	Coastal Headwater Pond	Spawning Adult	High	3.50
Alewife	Mid Atlantic	Riverine	Low Gradient Coastal Stream	Egg & Larva	High	3.50
Alewife	Mid Atlantic	Riverine	Low Gradient Coastal Stream	Juvenile & Young-of-Year	Low	1.00
Alewife	Mid Atlantic	Riverine	Low Gradient Coastal Stream	Spawning Adult	High	3.50
Alewife	Mid Atlantic	Riverine	Moderate Gradient Large Mainstem Riv	Egg & Larva	Low	1.00
Alewife	Mid Atlantic	Riverine	Moderate Gradient Large Mainstem Riv	Juvenile & Young-of-Year	Low	1.00

Science and Data

Species	Region	Habitat Category	Habitat Type	Life Stage	Rank	Numeric Rank
	× South Atlantic × South Florida	× Submerged Aquatic Vegetation		× Egg & Larva × Juvenile & Young-of-Year		
American Eel	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00
American Eel	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Medium	2.00
American Shad	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00
American Shad	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	High	3.50
Atlantic Croaker	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00
Atlantic Croaker	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Medium	2.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Egg & Larva	Low	1.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Egg & Larva	Low	1.00
Atlantic Menhaden	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Sharpnose Shark	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Sharpnose Shark	South Atlantic	Submerged Aquatic Vegetation	Tidal Fresh & Oligohaline Species	Juvenile & Young-of-Year	Low	1.00
Atlantic Silverside	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Egg & Larva	High	3.50
Atlantic Silverside	South Atlantic	Submerged Aquatic Vegetation	Mesohaline & Polyhaline Species	Juvenile & Young-of-Year	Medium	2.00

Hab in the MAB

Characterizing black sea bass habitat in the Mid-Atlantic Bight

Objective

To improve our understanding of the relationship between black sea bass abundance and habitat characteristics

Expected Outcome

Understand the influence of habitat on fisheries productivity and recruitment, and better manage the fishery.

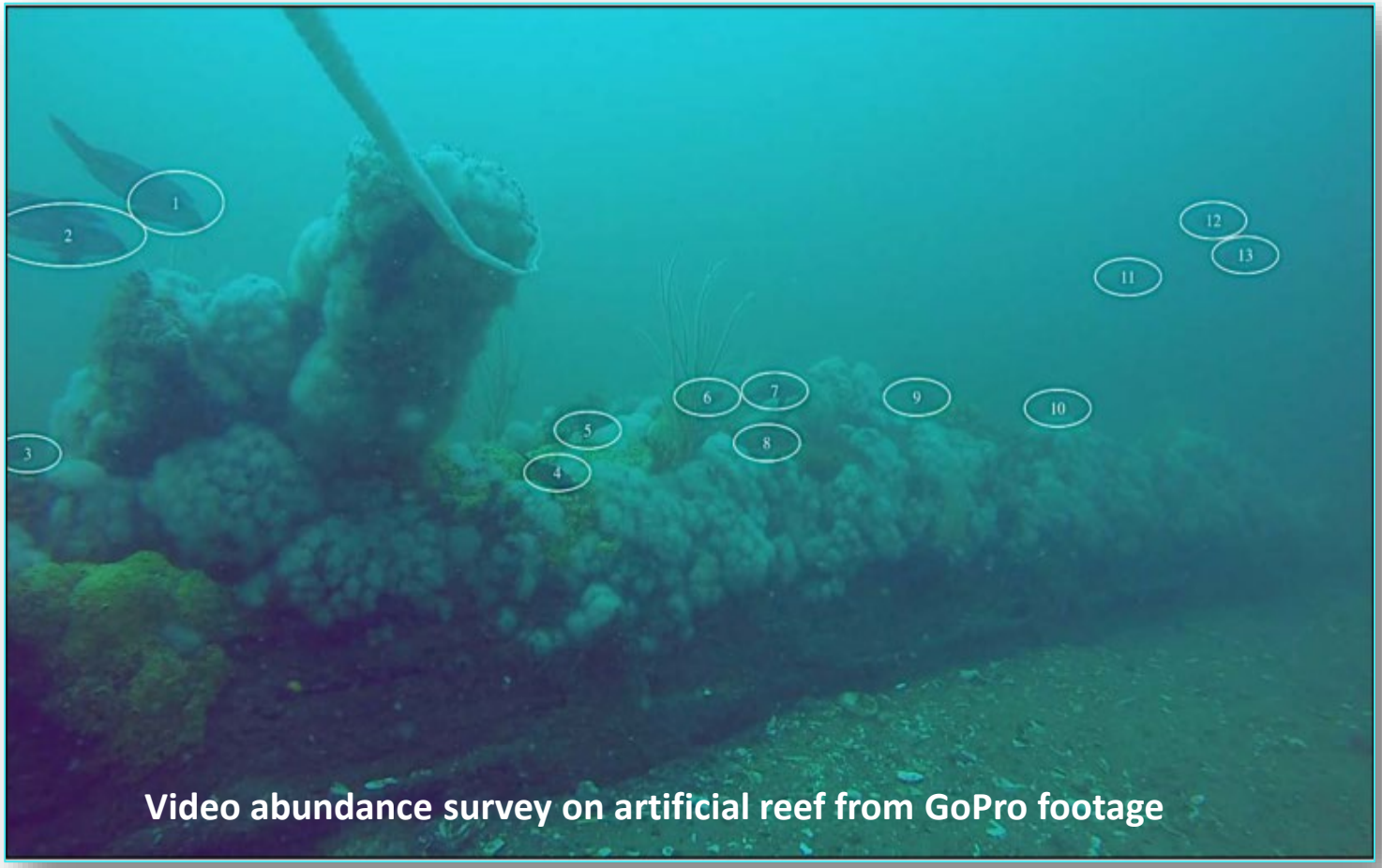
Hab in the MAB

Characterizing black sea bass habitat in the Mid-Atlantic Bight

- Determine the preference of BSB for particular habitats by assessing their abundance, size structure, and feeding ecology within natural and artificial reefs
- Improve the understanding of the habitat characteristics of natural and artificial reefs
- Determine if reduced fragmentation and increased connectivity of habitats increases fish recruitment

Science and Data

Video Surveys

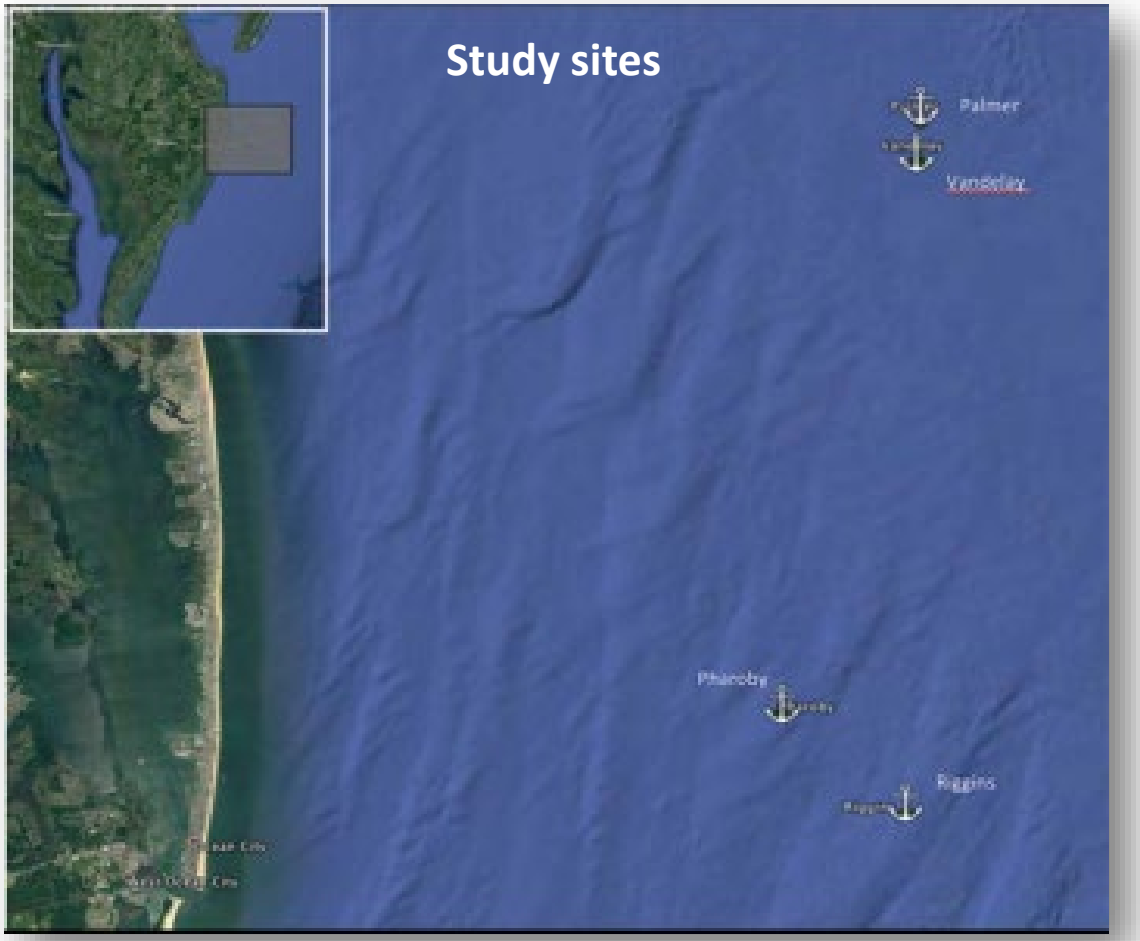


Video abundance survey on artificial reef from GoPro footage

Images courtesy of B. Stevens, UMES

Science and Data

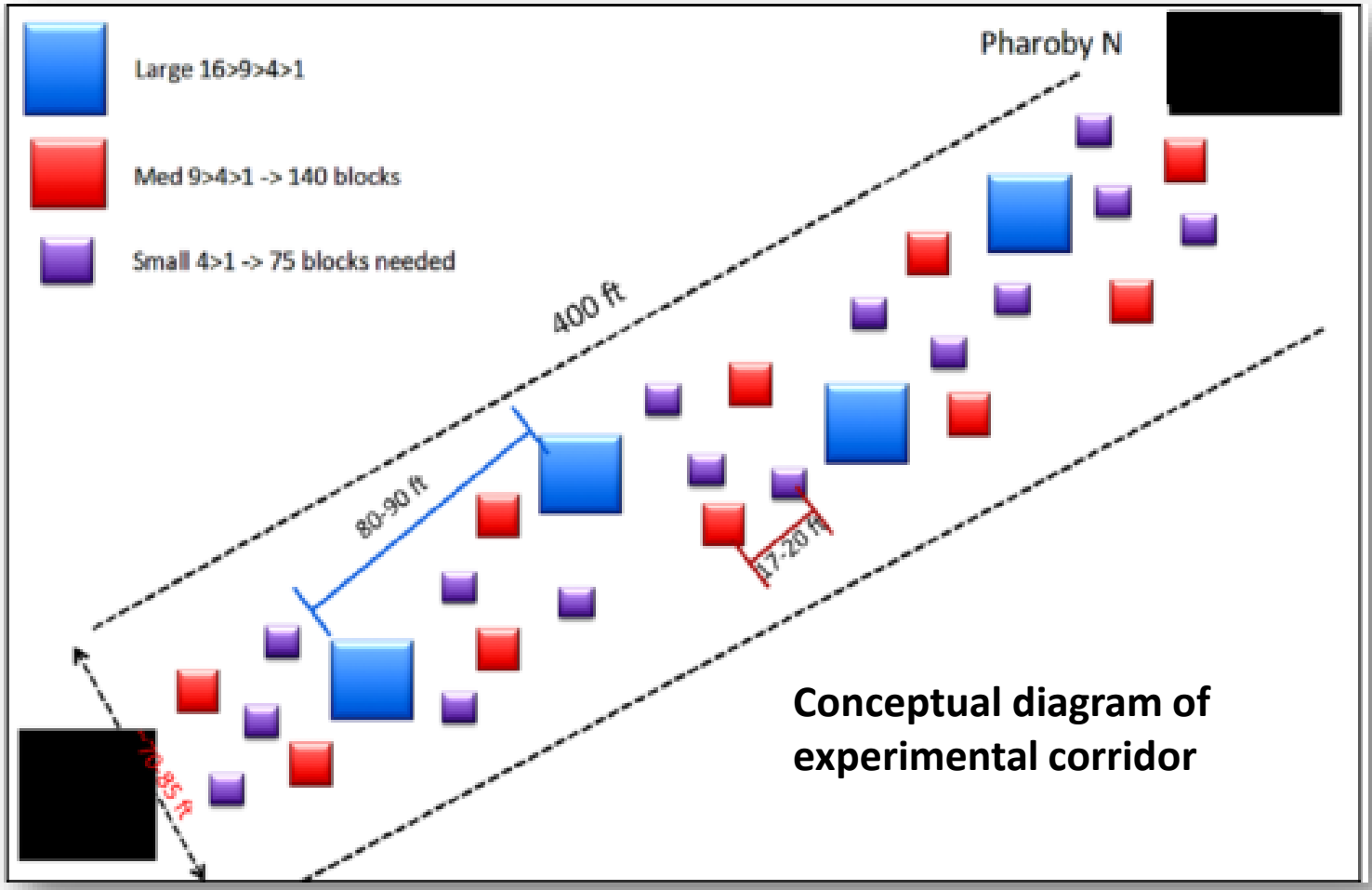
Stable Isotope Analysis & Aging



Images courtesy of B. Stevens, UMES

Science and Data

Habitat Connectivity



Conceptual diagram of experimental corridor

Images courtesy of B. Stevens, UMES

Southeast Fish Habitat Conservation Mapping

Objective

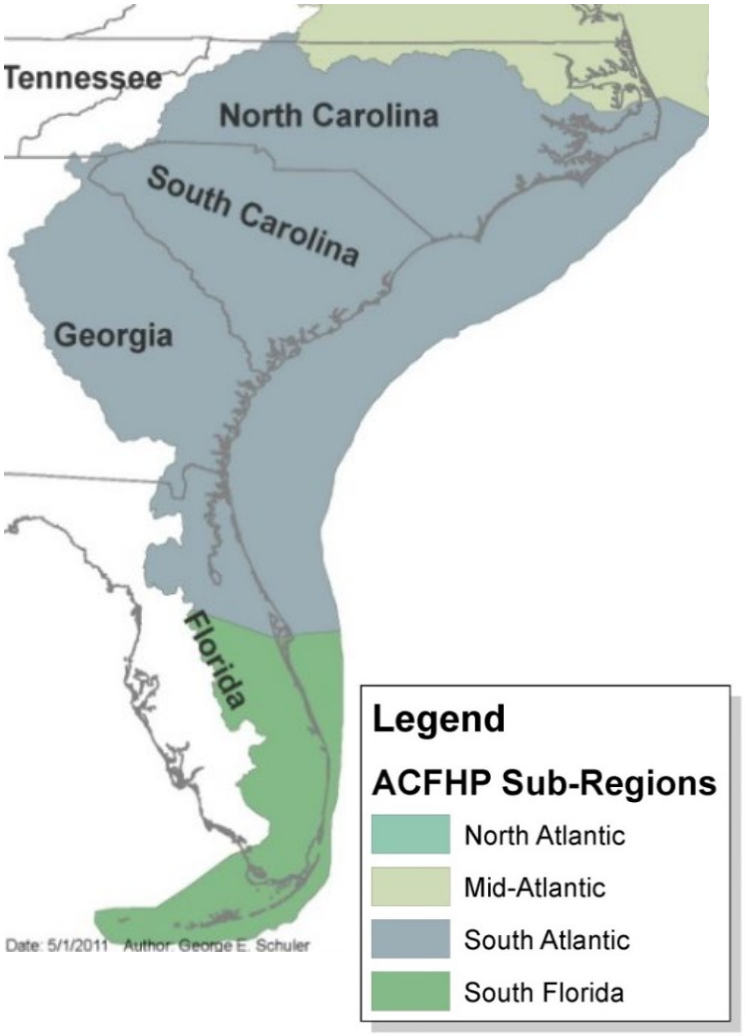
To spatially prioritize fish habitat protection and restoration sites through GIS mapping and analyses for the southeast region of the U.S. from NC to FL for ACFHP on-the-ground conservation prioritization

Expected Outcome

To help ACFHP and partners identify where best to invest efforts and future project funds.

Science and Data

Scope



Mid- & South Atlantic

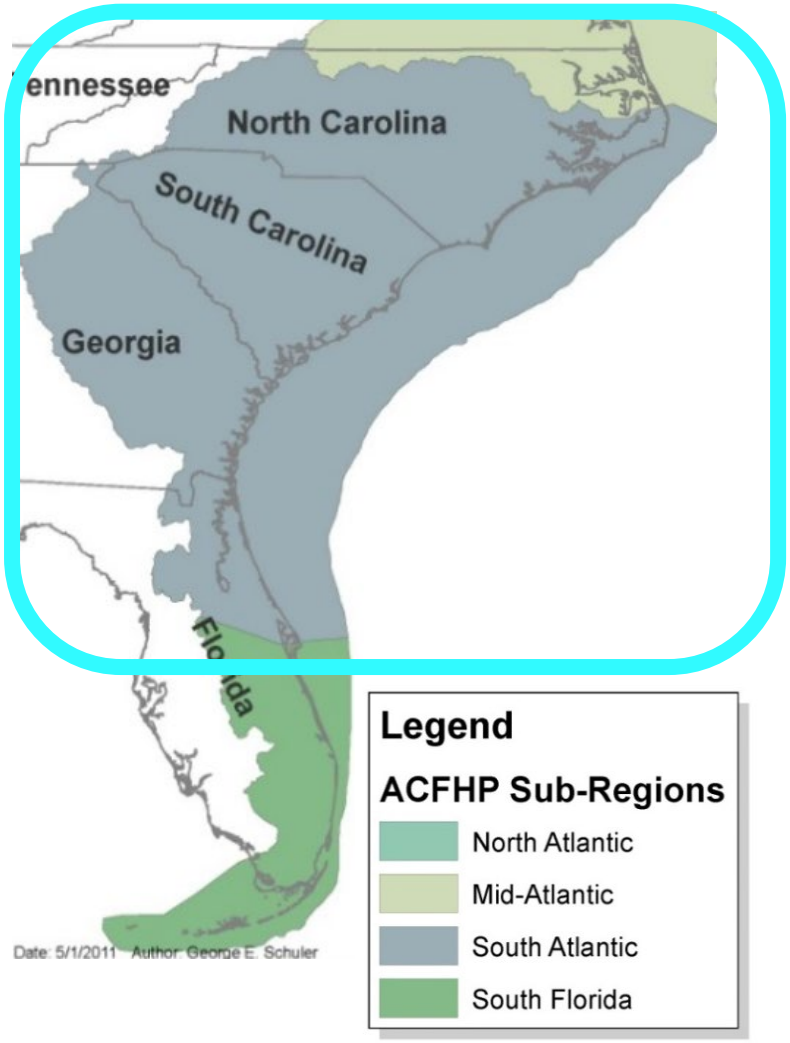
- Riverine bottom
- Shellfish beds
- SAV
- Tidal vegetation

South Florida

- SAV
- Tidal vegetation
- Coral and live/hard bottom

Science and Data

Scope



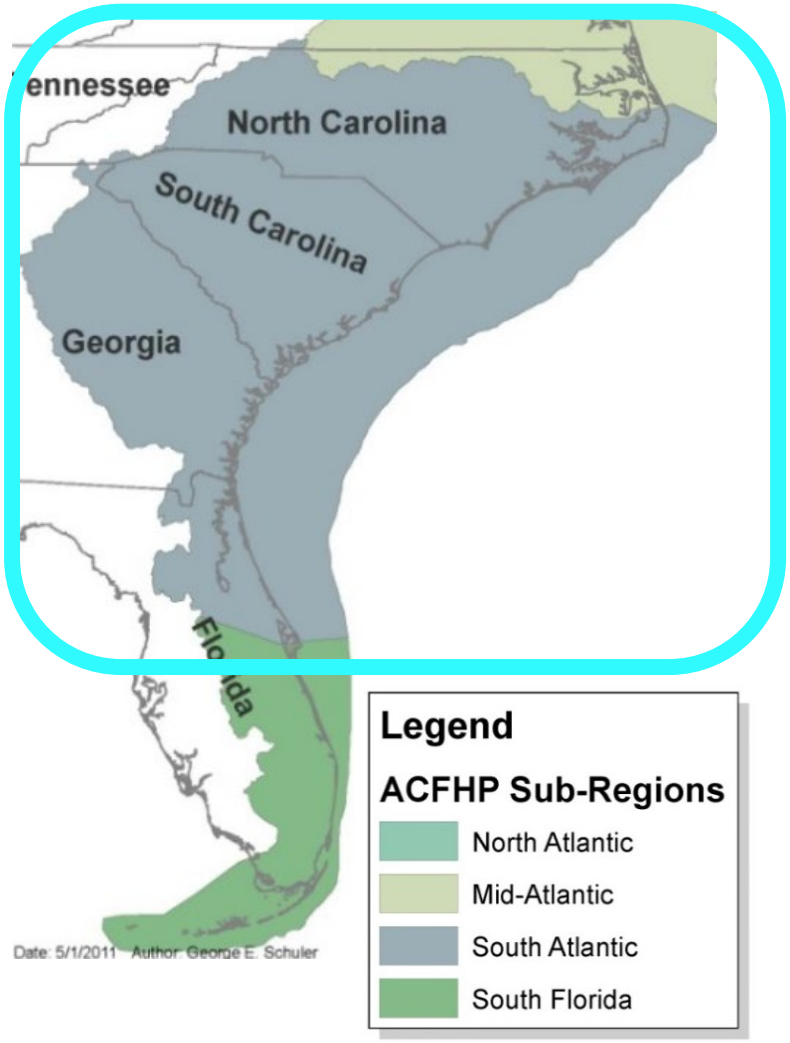
Northern Scenario

- **Riverine bottom**
- Shellfish beds
- SAV
- Tidal vegetation

Diadromous assessment

Science and Data

Scope



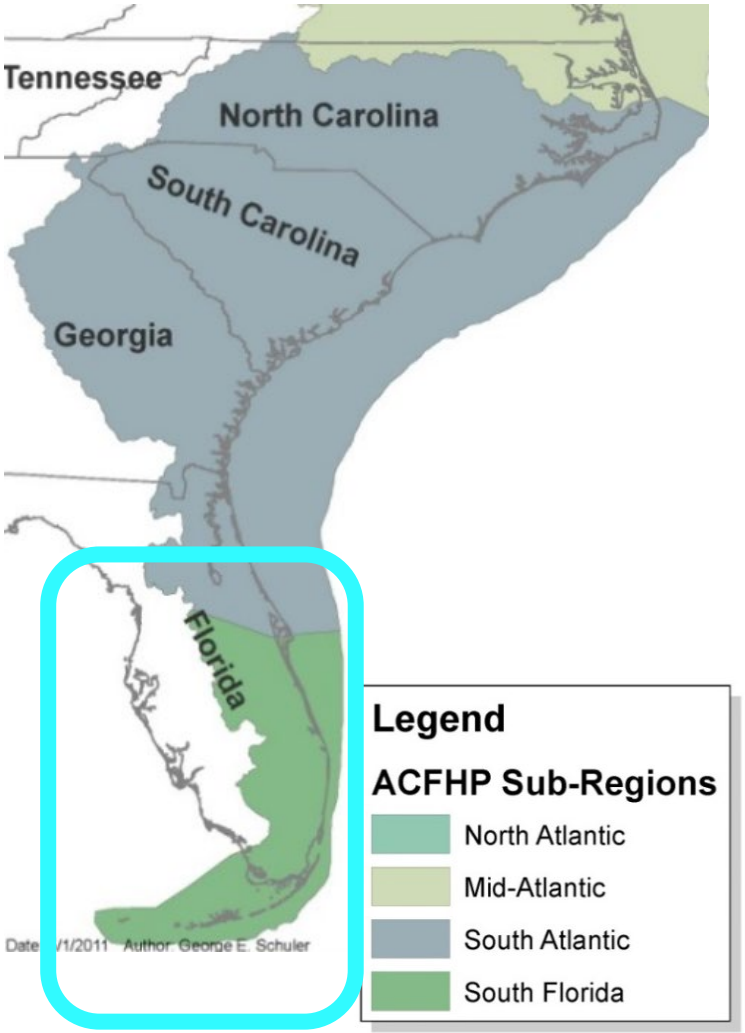
Northern Scenario

- Riverine bottom
- **Shellfish beds**
- **SAV**
- **Tidal vegetation**

Estuarine assessment

Science and Data

Scope



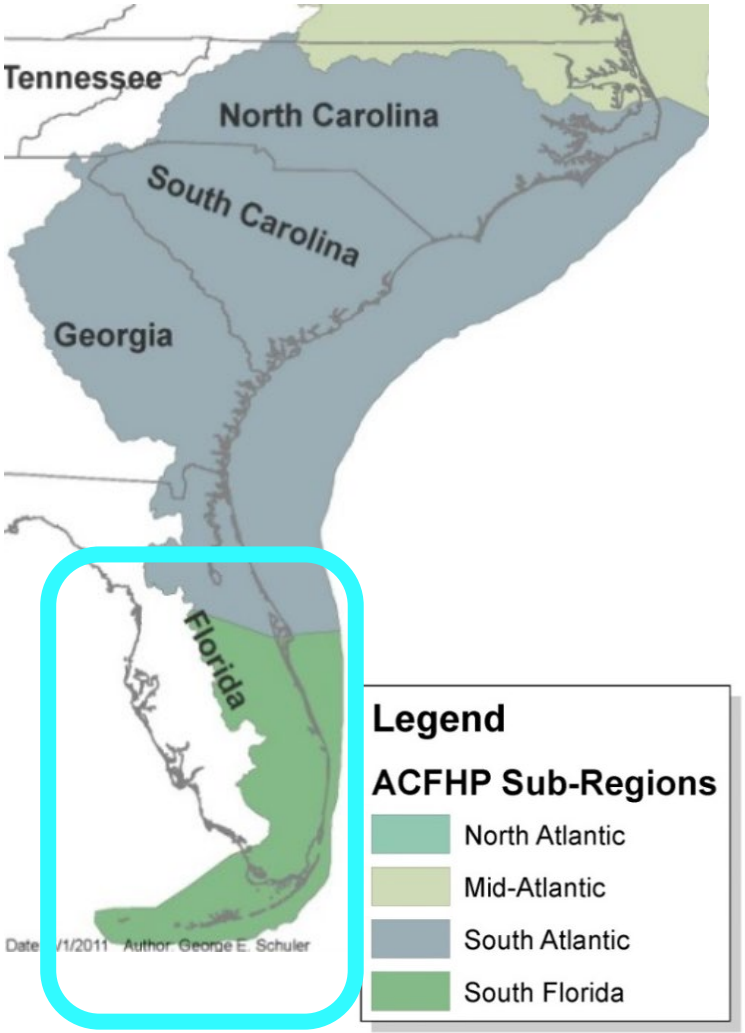
Southern Scenario

- **SAV**
- **Tidal vegetation**
- Coral and live/hard bottom

Estuarine assessment

Science and Data

Scope



South Florida

- SAV
- Tidal vegetation
- **Coral and live/hard bottom**

Coastal assessment

Science and Data

Scope

- Northern diadromous scenario
  - NHD catchment in watersheds with diadromous fish or drained into them
- Northern and southern estuarine scenario
  - 1-km^2 hexagon
- Southern coastal scenario
  - varied

Science and Data

Metrics and scoring

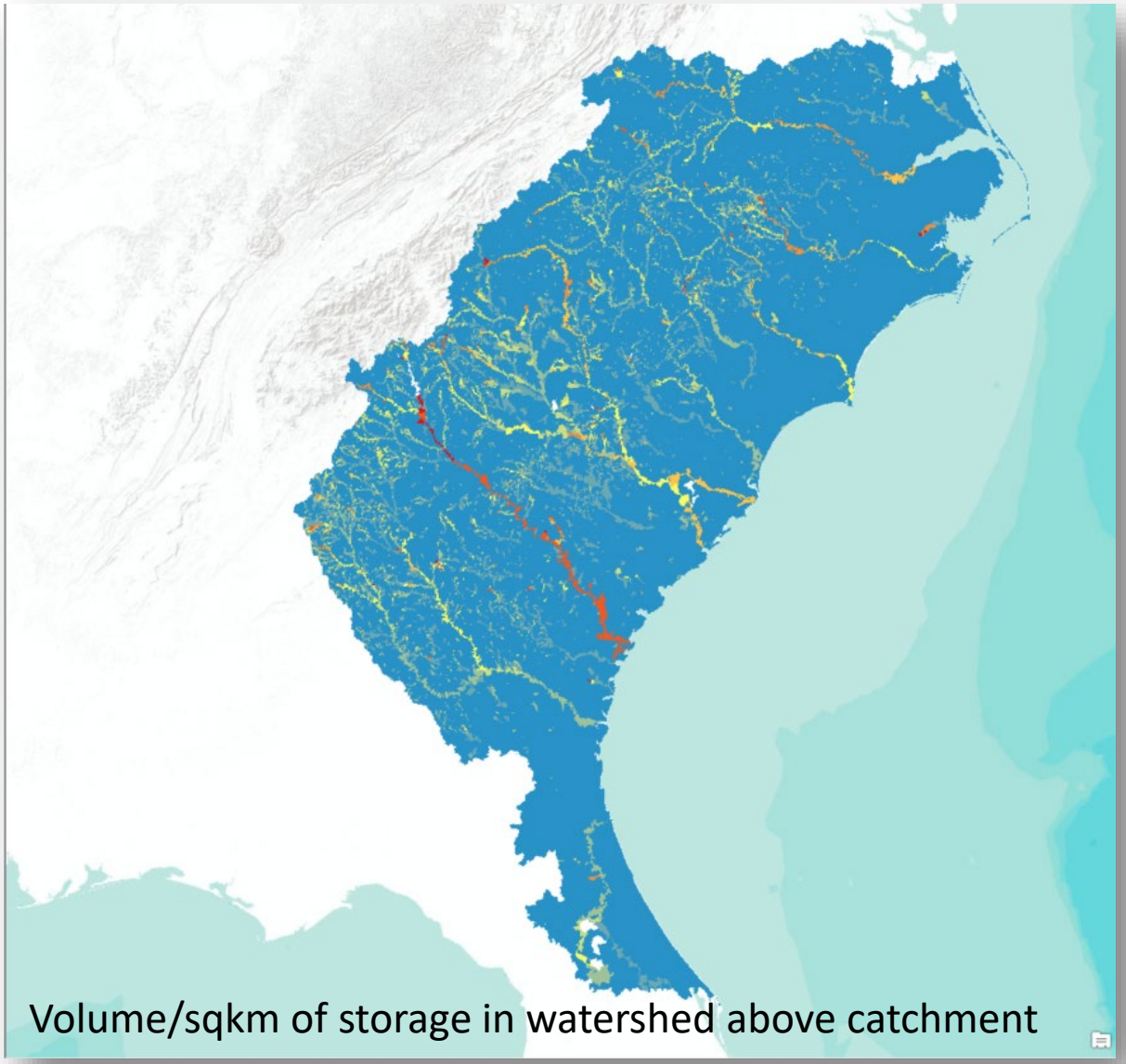
- Science & Data Committee webinar June 2017
- Science & Data Committee meeting Sept 2017
  - Metrics that covered the entire region
  - Metrics that most impact fish habitat
  - Tried to not be redundant
- Steering Committee meeting Oct 2017 & May 2018
- Science & Data committee webinar June 2018

Diadromous Assessment

Variable	Measurement	Metric
Impervious surface	area above the catchment that is impervious surface	10 points if <5% cumulative impervious surface
Point source pollution	Density of sites in catchment	10 points if catchment is ranked in the lowest 25% for pollution (least polluted)
Non-point source pollution	% of catchment covered by agriculture	10 points if the catchment is ranked in the lowest 25% for pollution (least polluted)
Riparian buffers	% of floodplain area with natural land cover	10 points if the catchment is ranked in the top 25% for natural coverage
Potential for species access	Diadromous species presence	10 points if the catchment has at least one diadromous species present
Flow alteration	Volume of all reservoirs per unit area of watershed	10 points if the catchment is ranks in the lowest 25% for volume
Fragmentation	Density of road crossings + dams in catchment	10 points if the catchment had zero dams downstream to the ocean. 10 points if the catchment is ranked in the lowest 25% for fragmentation (least amount of crossings and dams).
Sturgeon Critical Habitat	Sturgeon Critical Habitat designation	10 points if the catchment is designated Atlantic sturgeon Critical Habitat

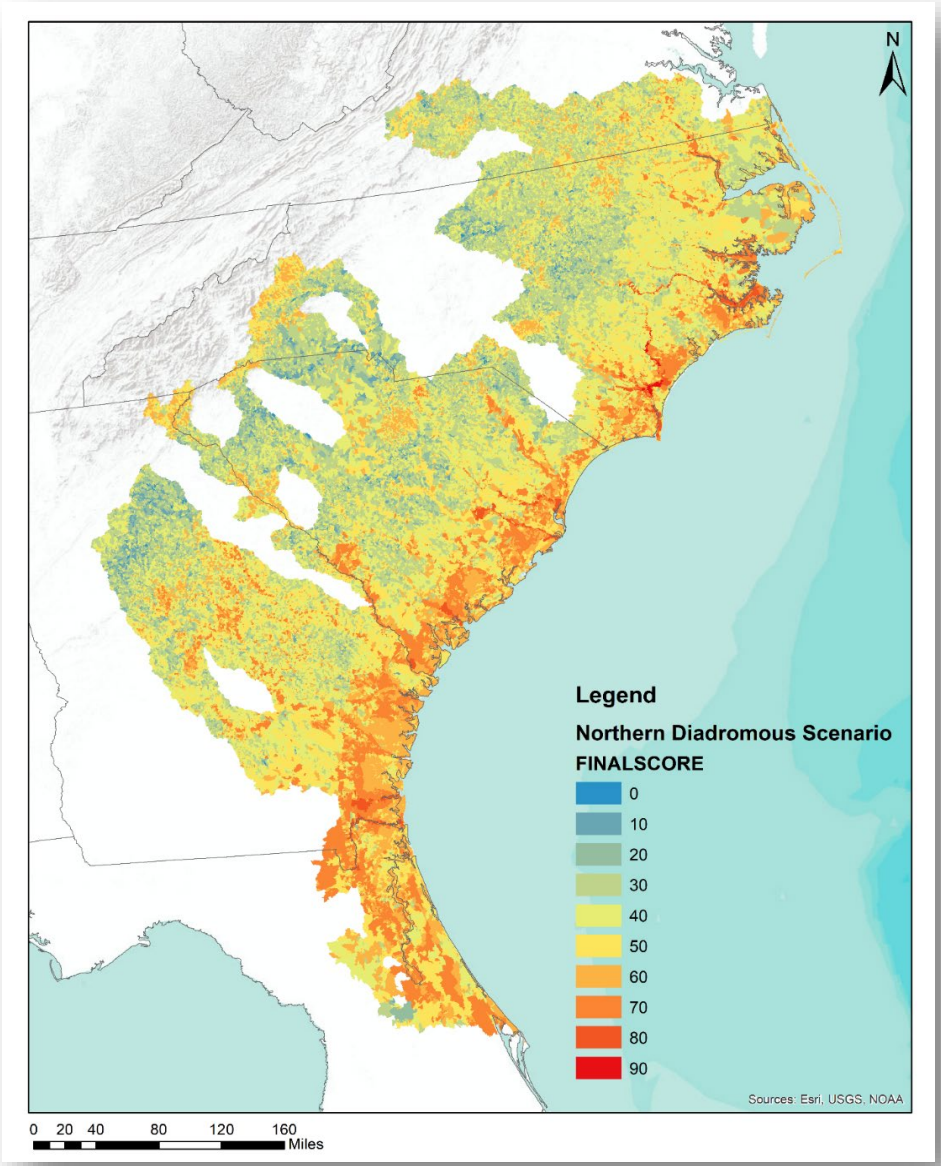
Science and Data

Flow Alteration



Science and Data

Diadromous Assessment

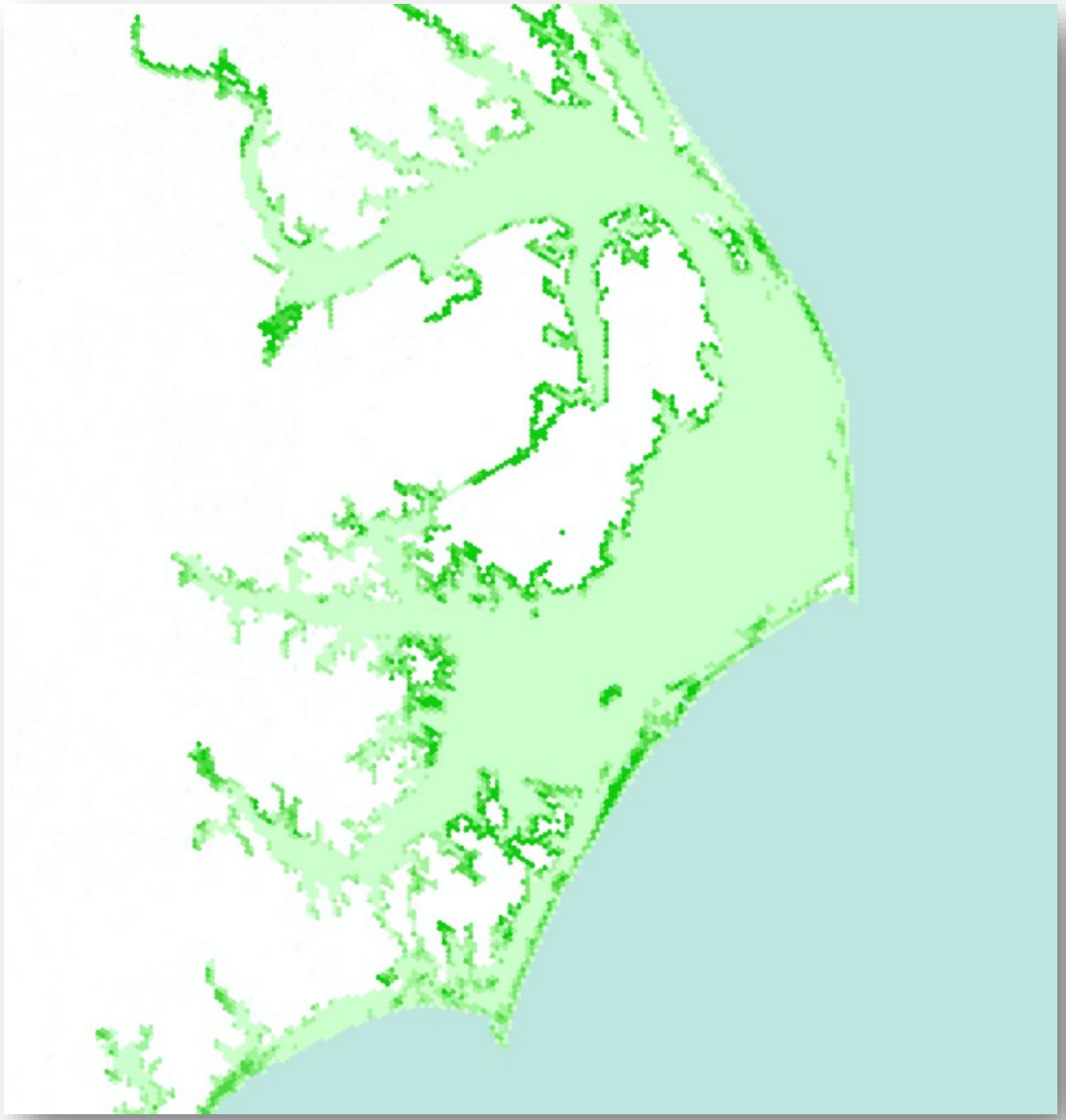


Estuarine Assessment

Variable	Measurement	Metric
Seagrass and oyster reef habitat	% of polygon covered by seagrass or oyster reef	10 points if the polygon ranks in the top 25% for coverage
Wetland habitat	% of polygon covered by wetlands	10 points if the polygon ranks in the top 25% for coverage
Estuarine-marsh-water edge	Length of estuarine-marsh-water edge in the polygon	10 points if the polygon ranks in the top 25% for length
Proximity to protected habitat	Distance to inlet (an HAPC in the South Atlantic)	10 points if the polygon is within ½ km of an inlet
Proximity to development	Distance from marinas and ports	10 points for the 25% of polygons farthest from marinas and ports
Water quality	Total # of NPDS permit sites in the inlet	10 points for the 25% of polygons with the least number of NPDS sites/inet
Hardened shoreline	Length of hardened shoreline within the polygon	10 points for the 25% of polygons with the least amount of hardened shoreline
Habitat fragmentation	Linear ft. of causeway within a polygon	10 points if the polygon has 0 ft. of causeways

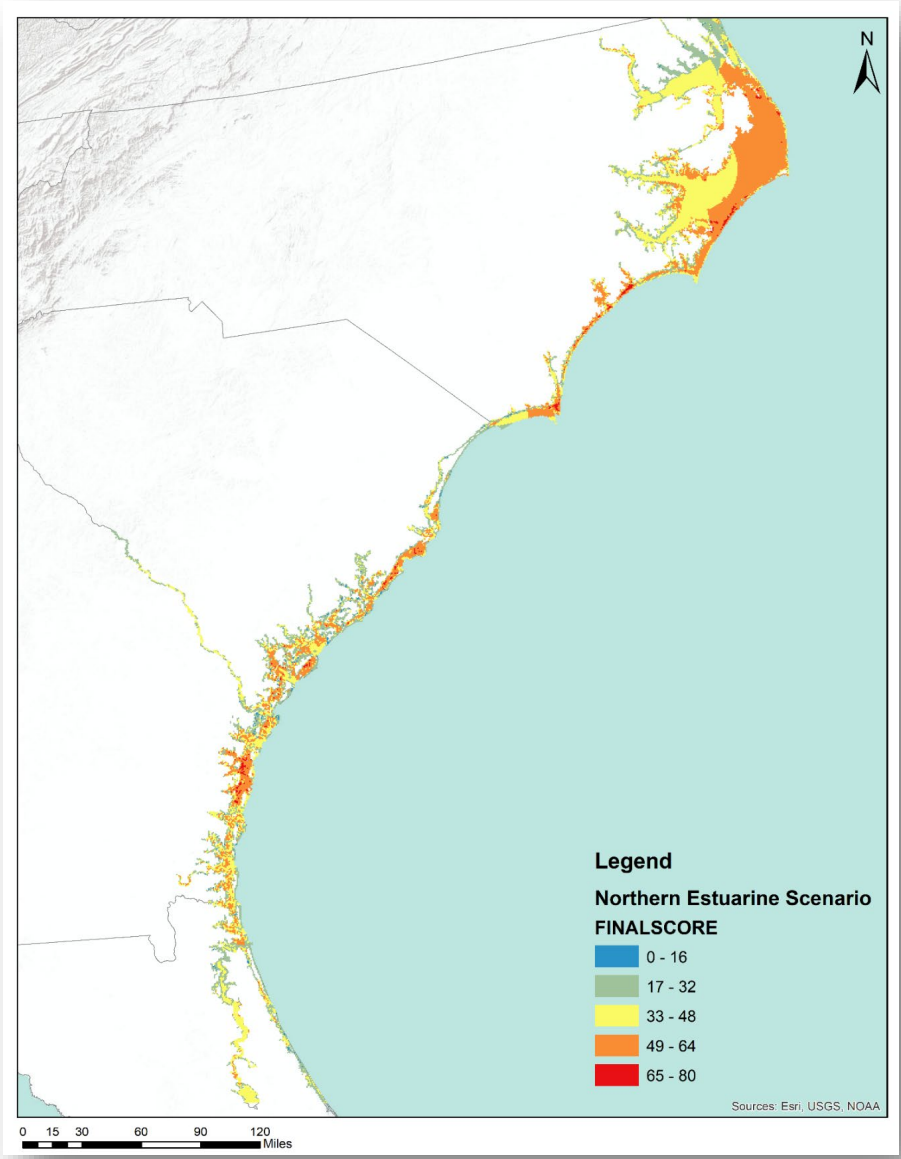
Science and Data

Wetlands



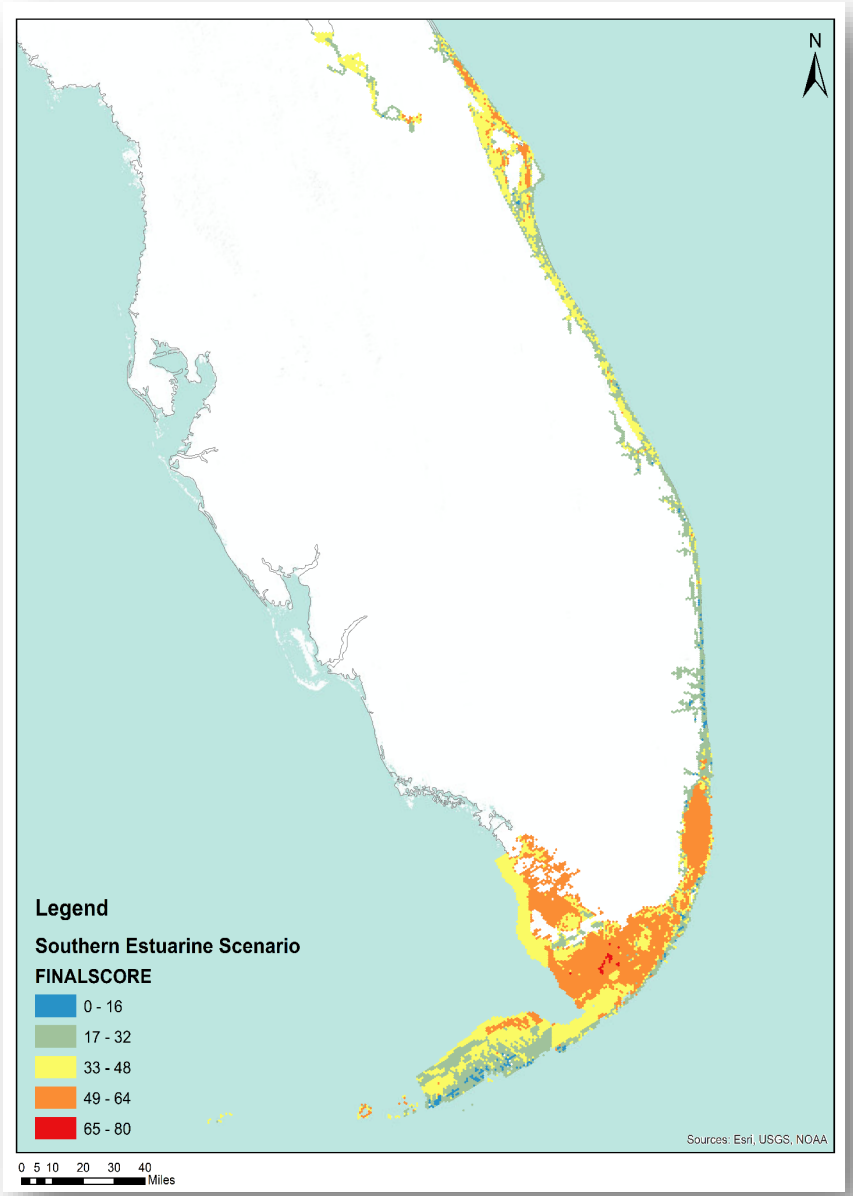
Science and Data

Northern Estuarine Assessment



Science and Data

Southern Estuarine Assessment

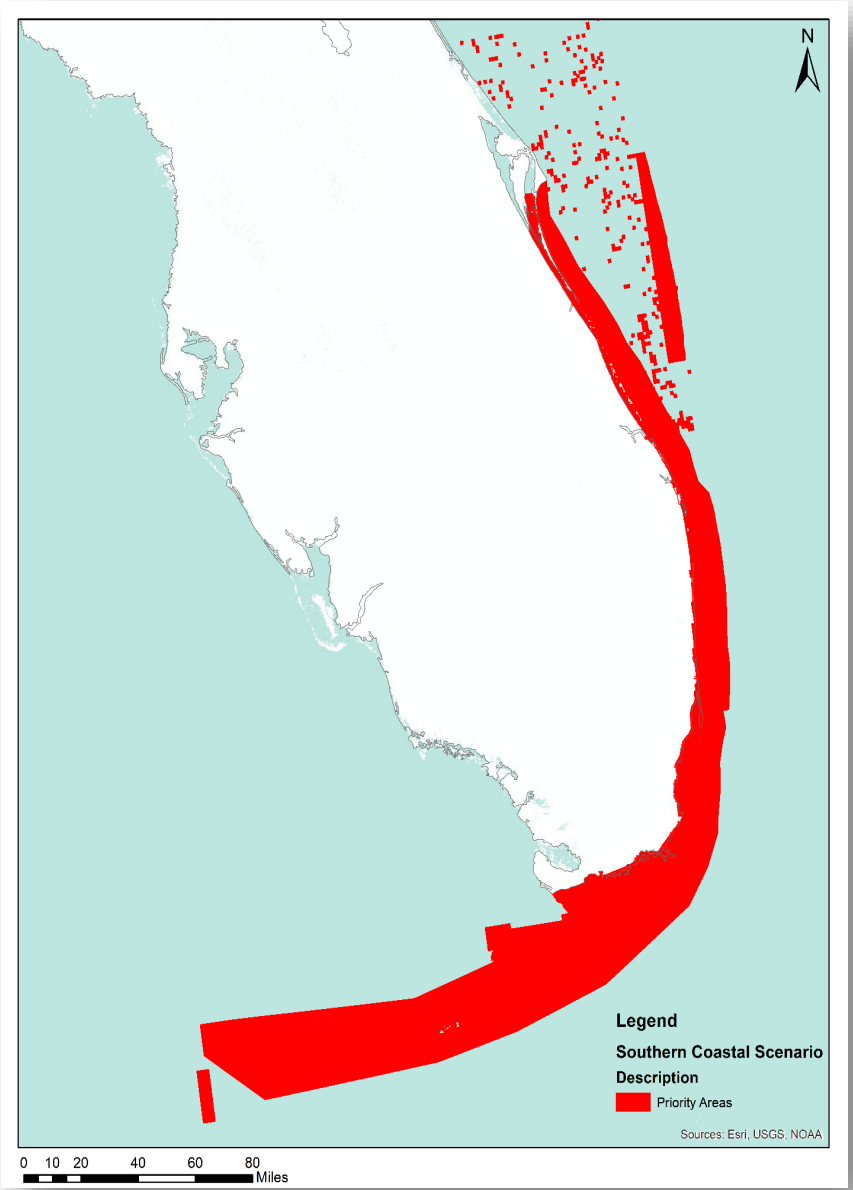


Coastal Assessment

- Decided all coral habitat was in need of conservation, regardless of quality
- Due to slow growth and immediate threats to S. FL reefs (bleaching, pollution, disease, burial)
- FWC Unified Reef Map
- Coral reefs and hard bottom HAPCs

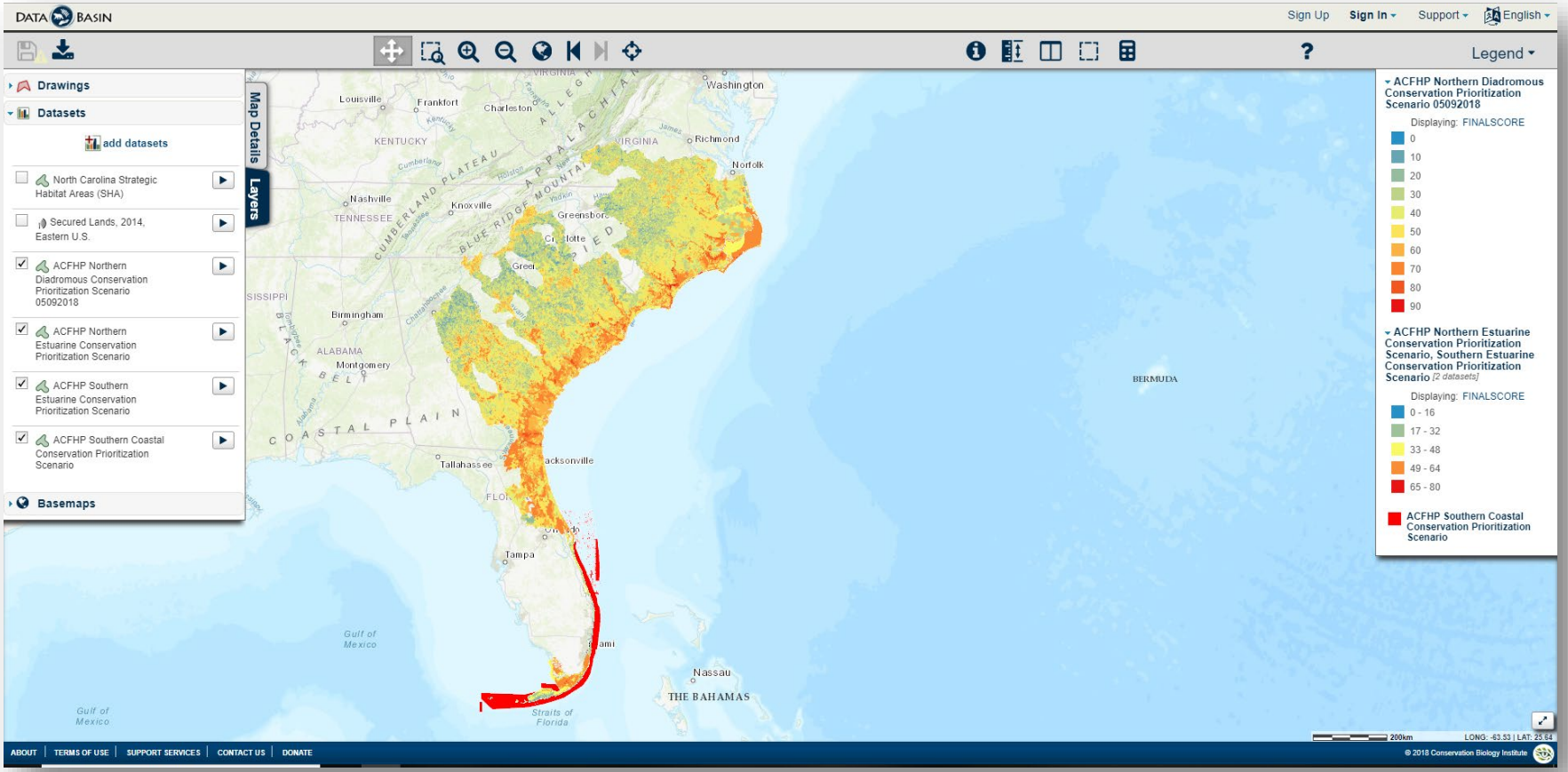
Science and Data

Coastal Assessment



Science and Data

Databasin



Science and Data

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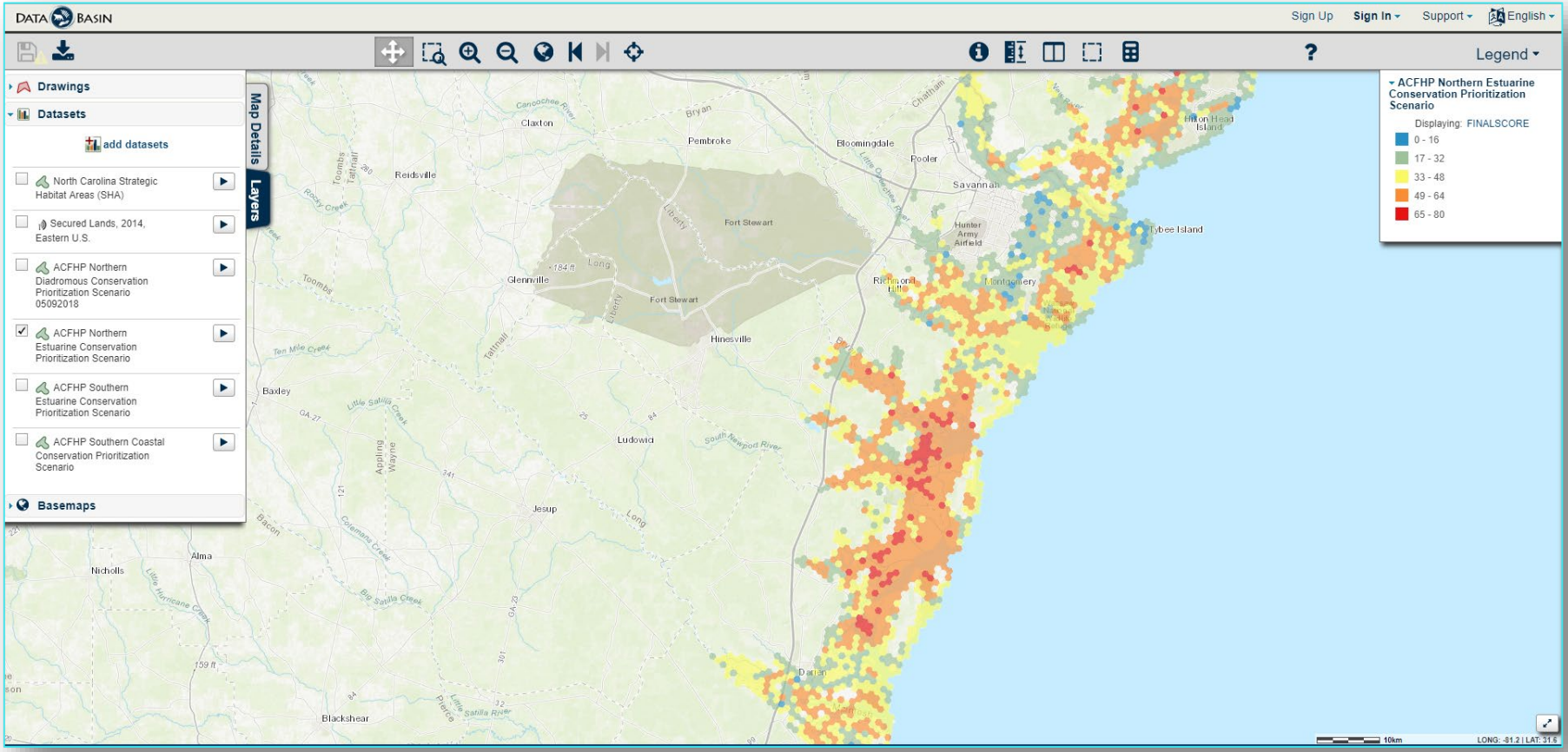

Science and Data

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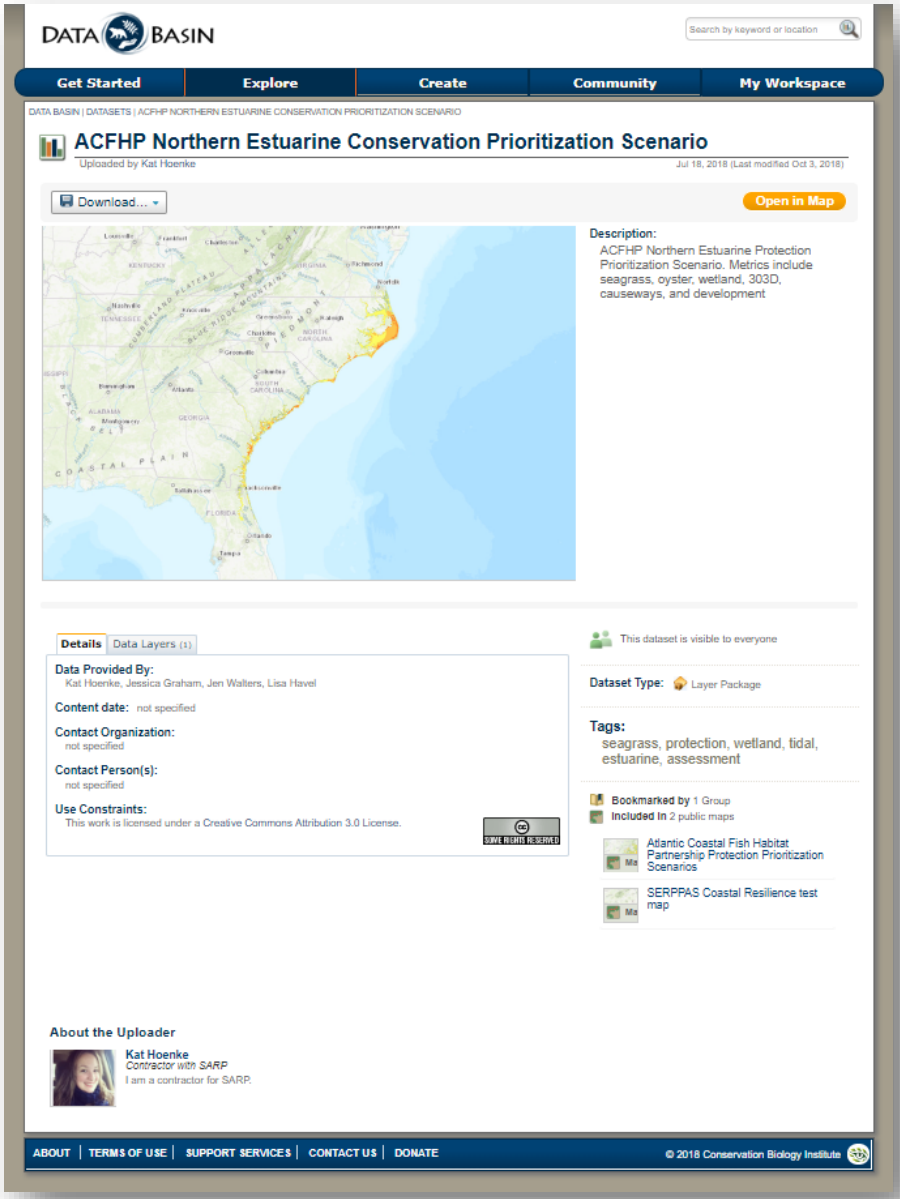
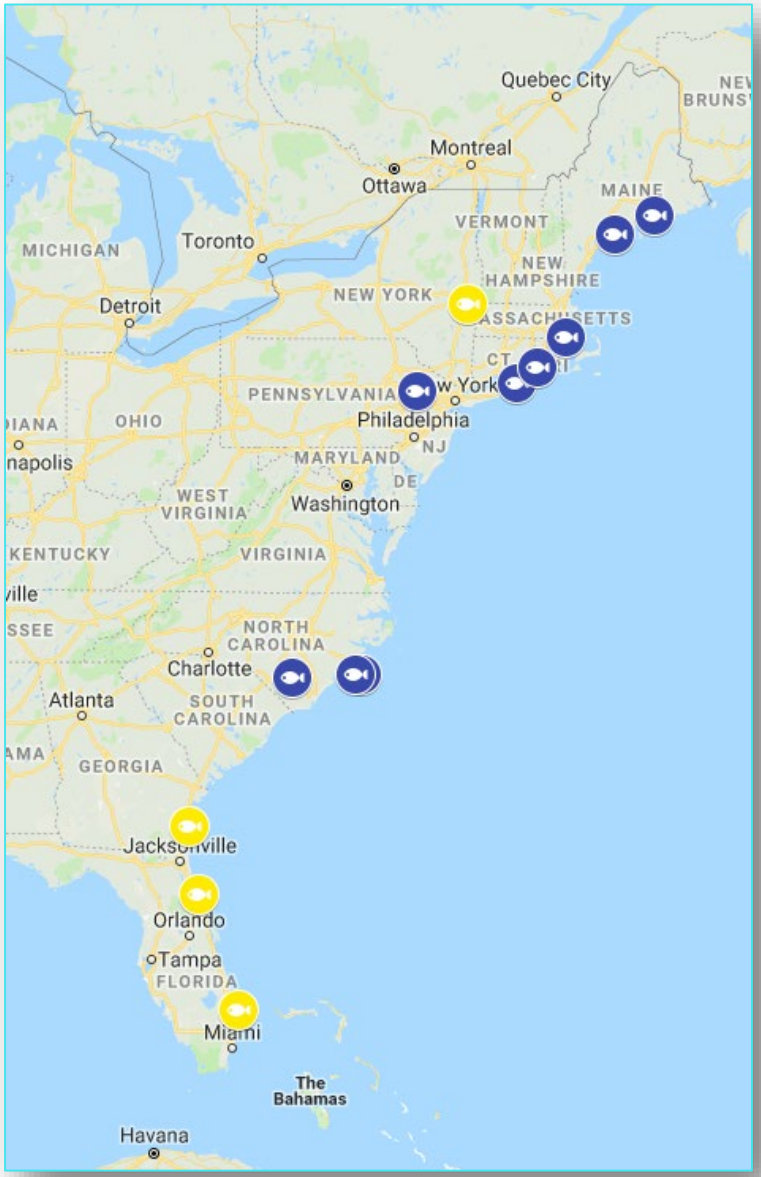


Science and Data

Next steps

- Finalize the report
- Create maps for each metric
- Announce it
- Start work on northeast assessment
- Improve on southeast assessment

On the Ground Projects



FY 2015 - present

- 9 funded projects
  - 2 shellfish beds
  - 2 tidal vegetation
  - 6 riverine
  - 1 SAV
- 5 endorsements
  - 2 shellfish beds
  - 2 tidal vegetation
  - 2 riverine
  - 1 SAV

On the Ground Projects

Oyster Reef Restoration in Back Sound

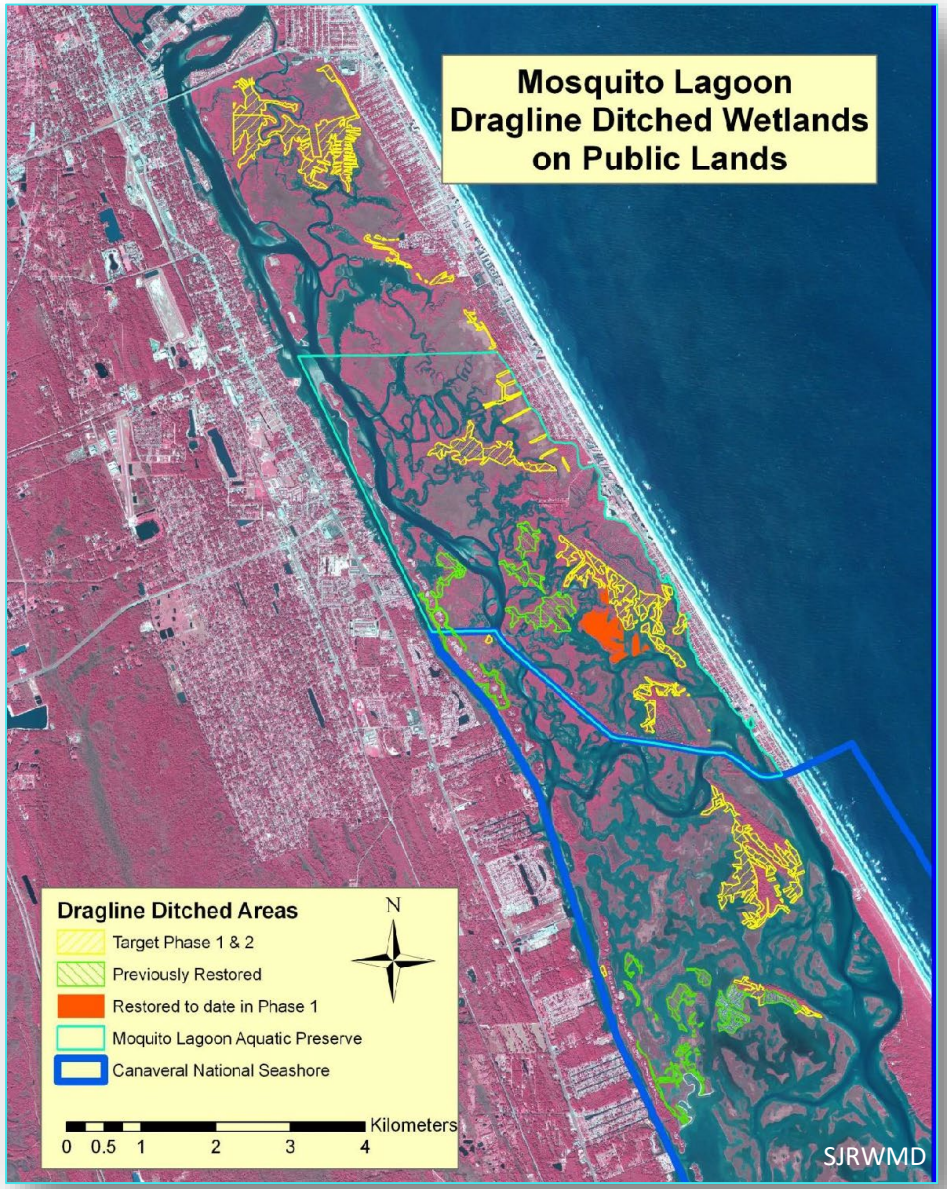
- Rachel Carson Reserve, NC
- ECU, NOAA, NCCF, USFWS
- Carrot Island eroding 1-2 m/yr
- 0.11 acres of oyster reef
- Protect 3 acres salt marsh

On the Ground Projects

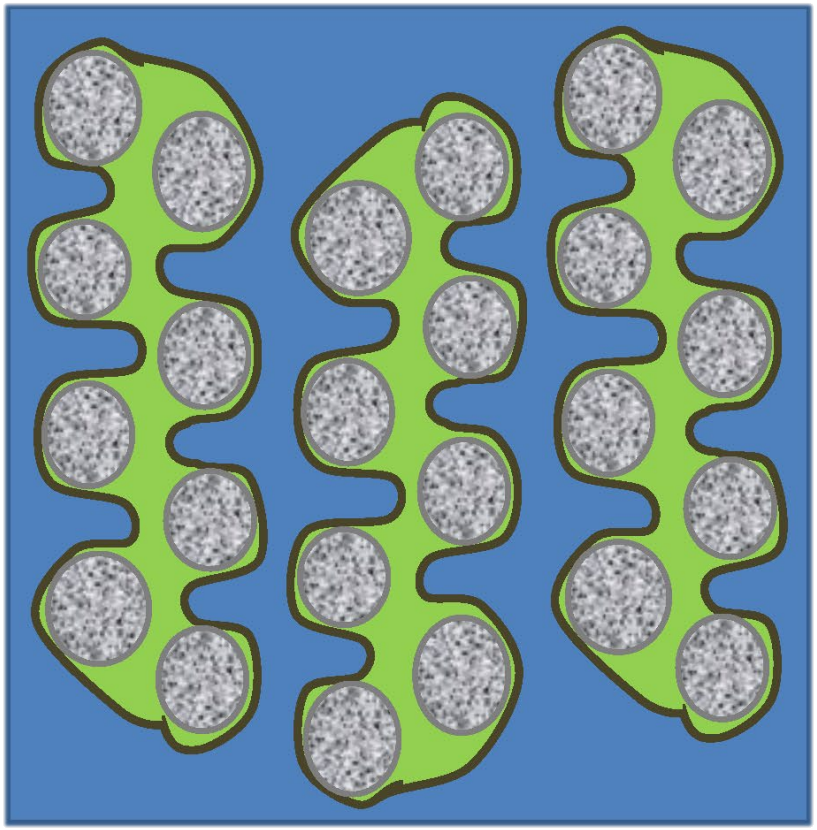
On the Ground Projects

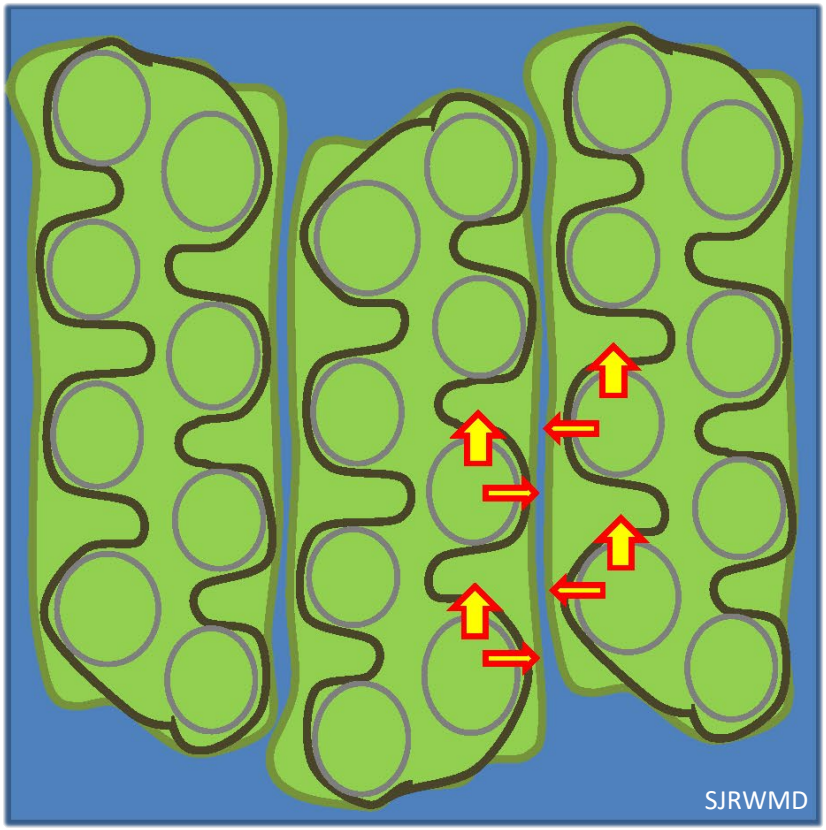
Dragline Ditch Restoration

- Northeast Florida
- FWC, SJRWMD, USFWS
- ~625 acres addressed
- 250 new acres
- 50 lbs of fish/acre/yr
- 31,250 lbs fish/yr



On the Ground Projects

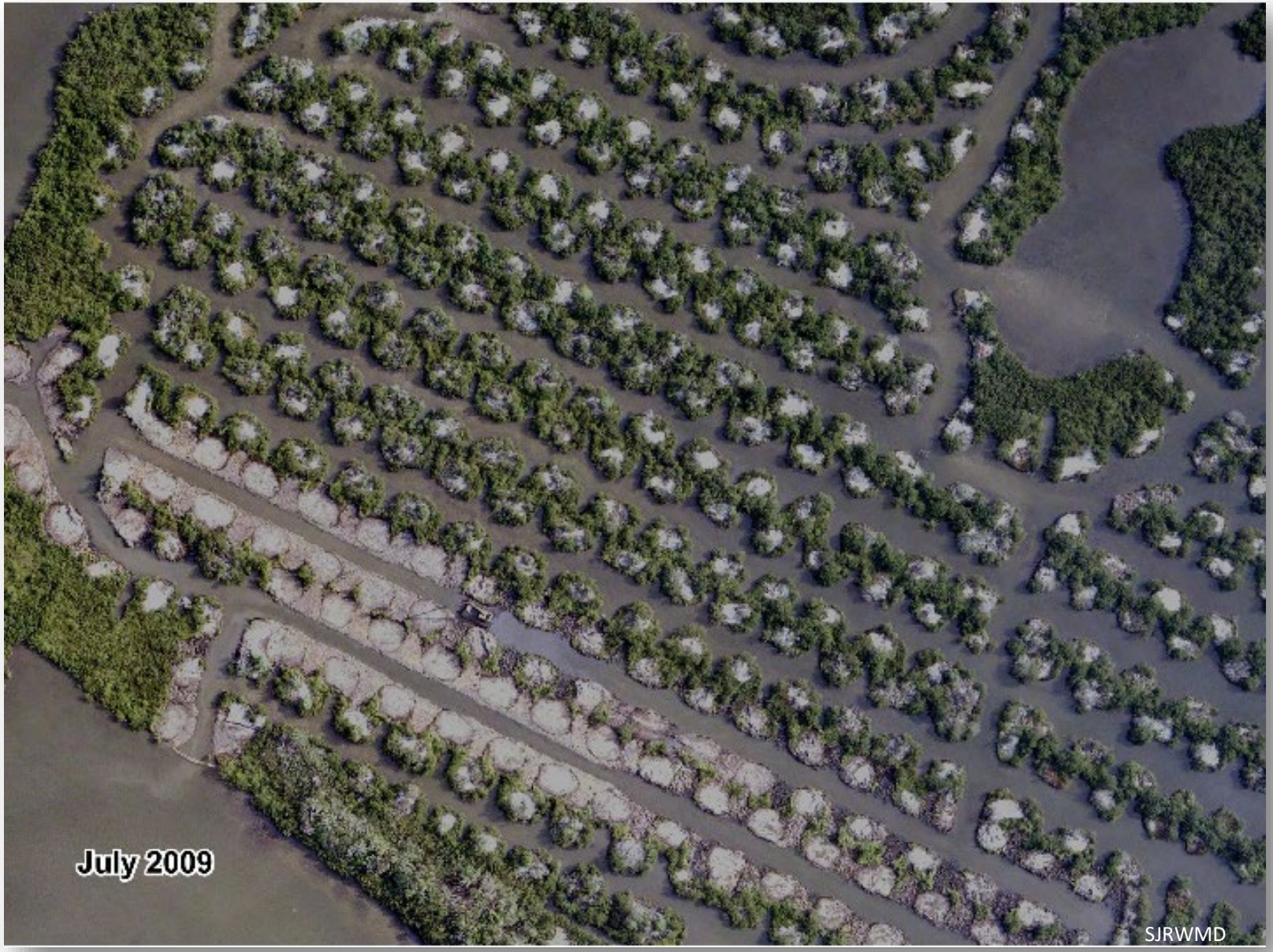




On the Ground Projects

On the Ground Projects

On the Ground Projects



On the Ground Projects

On the Ground Projects

Sheepscot River Restoration

- Whitefield & Alna, ME
- Atlantic Salmon Federation
- Coopers Mill Dam
- Head Tide Dam
- Built early 1800's
- Atlantic salmon Critical Habitat
- Dams greatest threat to continued existence

Photos in this section courtesy of ASF

On the Ground Projects

Sheepscot River Restoration

- Removed Coopers Mill Dam
- Partially removing Head Tide Dam
- Reconnect 71 river miles

On the Ground Projects

Sheepscot River Restoration

- Hydrants installed for fire protection
- Preserve certain historical and recreational features

On the Ground Projects

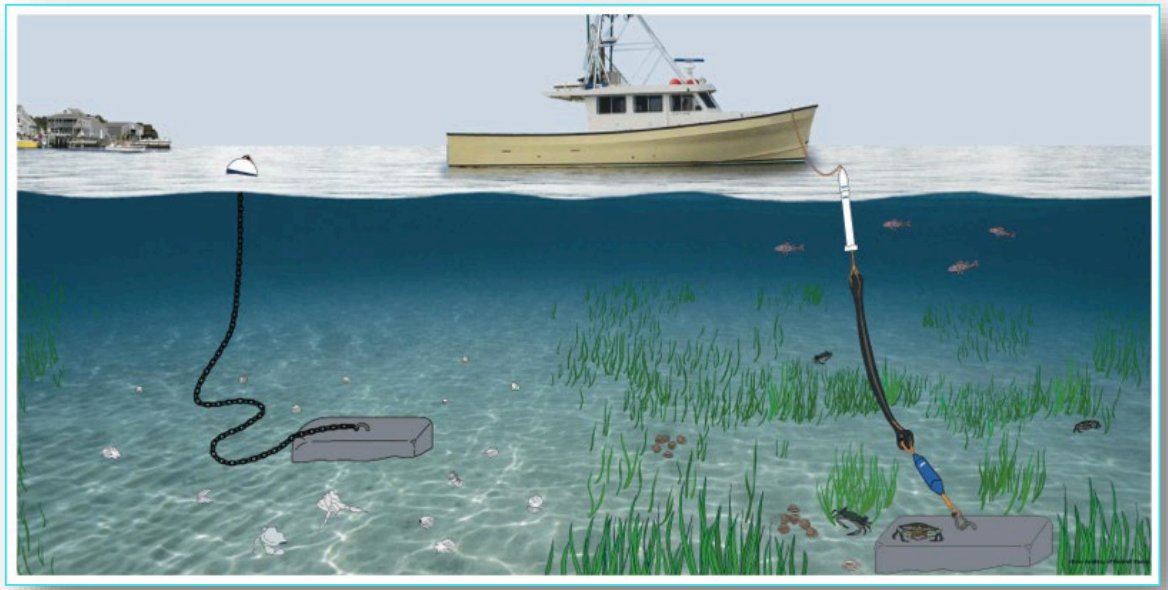
Conservation Moorings

- Coecles Harbor, NY
- NY DEC
- Eelgrass in decline across NY state
- Most extensive eelgrass in NY state
- Traditional moorings cause ‘haloing’

On the Ground Projects

Coecles Harbor

- Replacing traditional moorings with conservation moorings
- Restores and reconnects SAV, then protects for future



Questions?

Lisa Havel

Atlantic Coastal Fish Habitat Partnership Coordinator

lhavel@asmfc.org

(703) 842-0740

Habitat Restoration in Northeast Florida

Jeff Beal
Marine/Estuarine Subsection

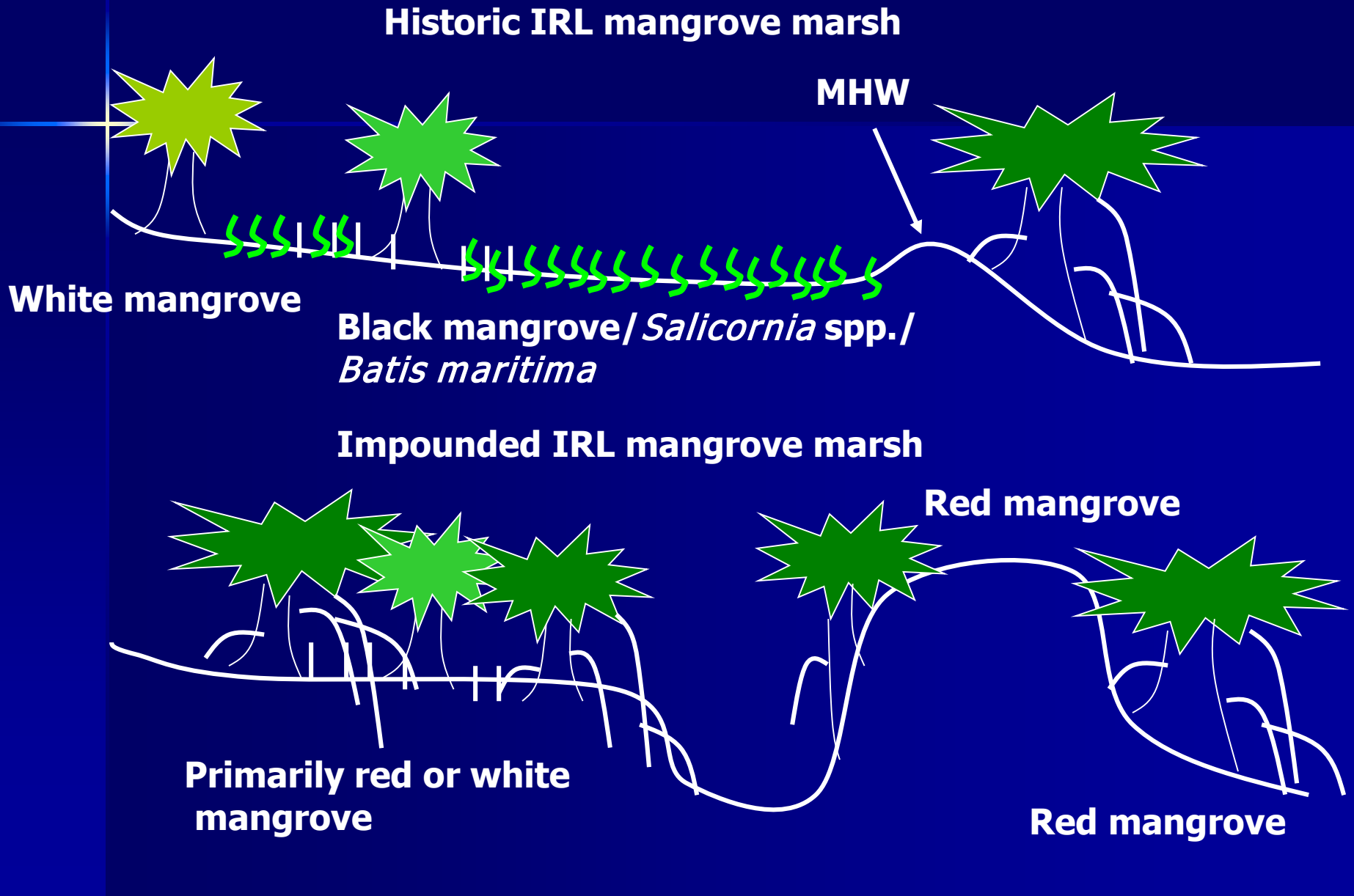
Restoring "Old Florida"

Restoration

Enhancement

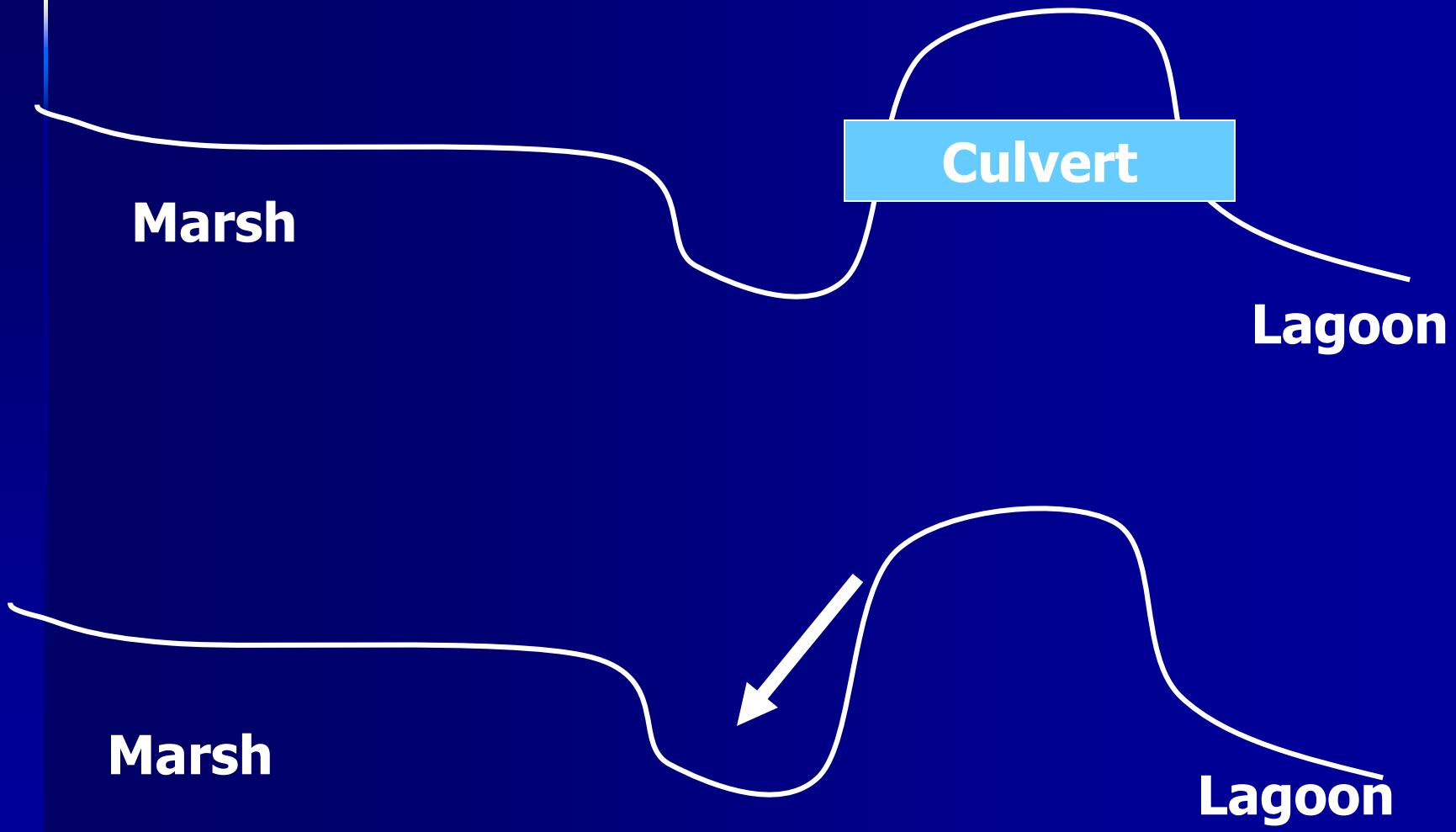
Rehabilitation

Impounding IRL marshes



Typical Impounded IRL marsh

Hydrologic Restoration



Water Level/Quality Manipulation

Ecological Effects of Reconnection

Open versus Rotational Impoundment Management (RIM)

Native vegetation recruitment

Studies showed increase of fish/decapod species to 107

94% of individuals were 13 resident species (46% of biomass)

6% of individuals were 94 transient species (54% of biomass)

99.5% of transient species biomass is commercially important ($24K/ha)

1500 juvenile snook in 3-hr culvert trap set

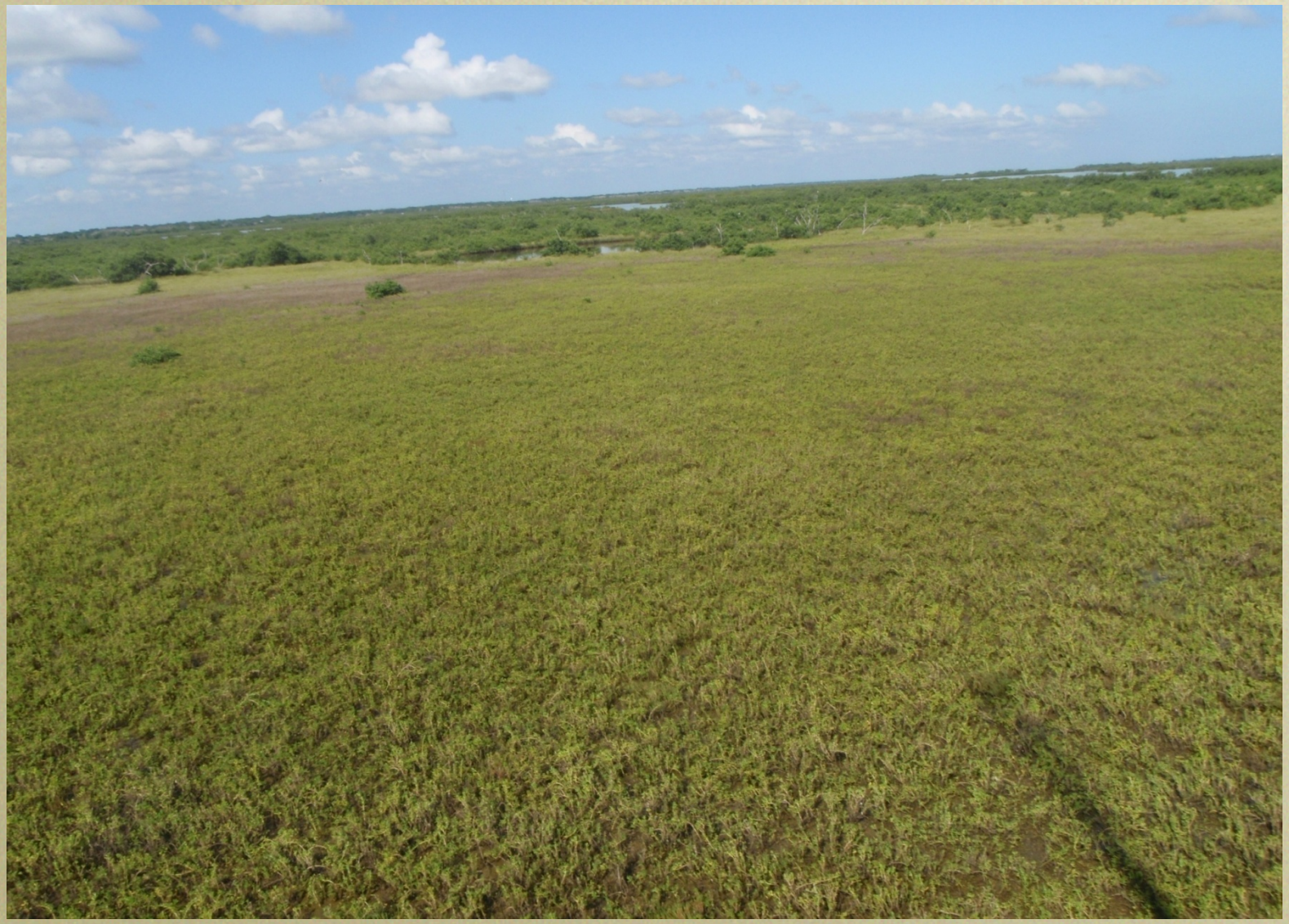
Aero Photo
727.520.8181
www.aerophoto.com

North Peninsula

Image # 100106 2113
Date 01.06.10

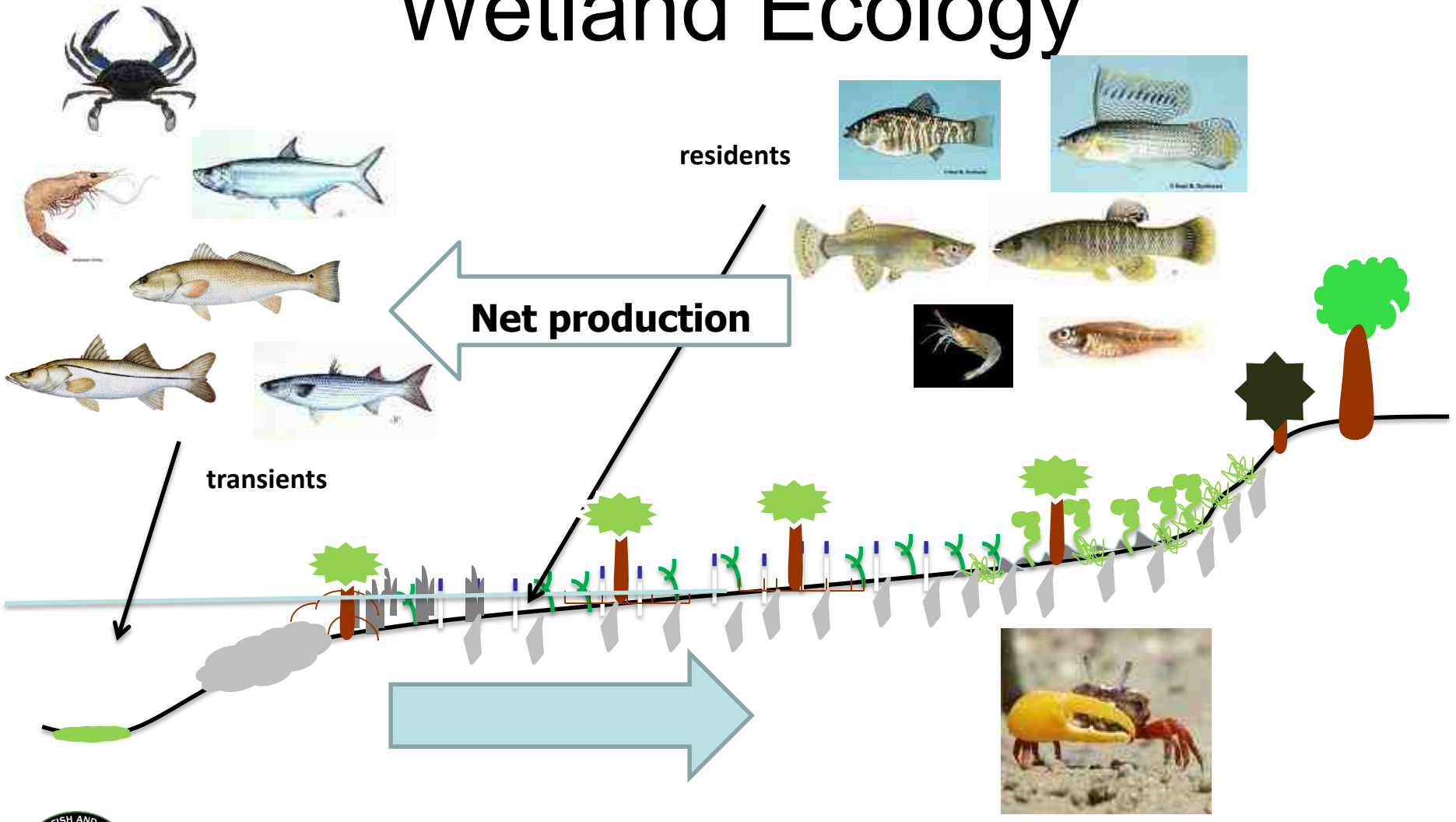
Shoreline Stabilization Demonstration Are

Seawall Retrofits



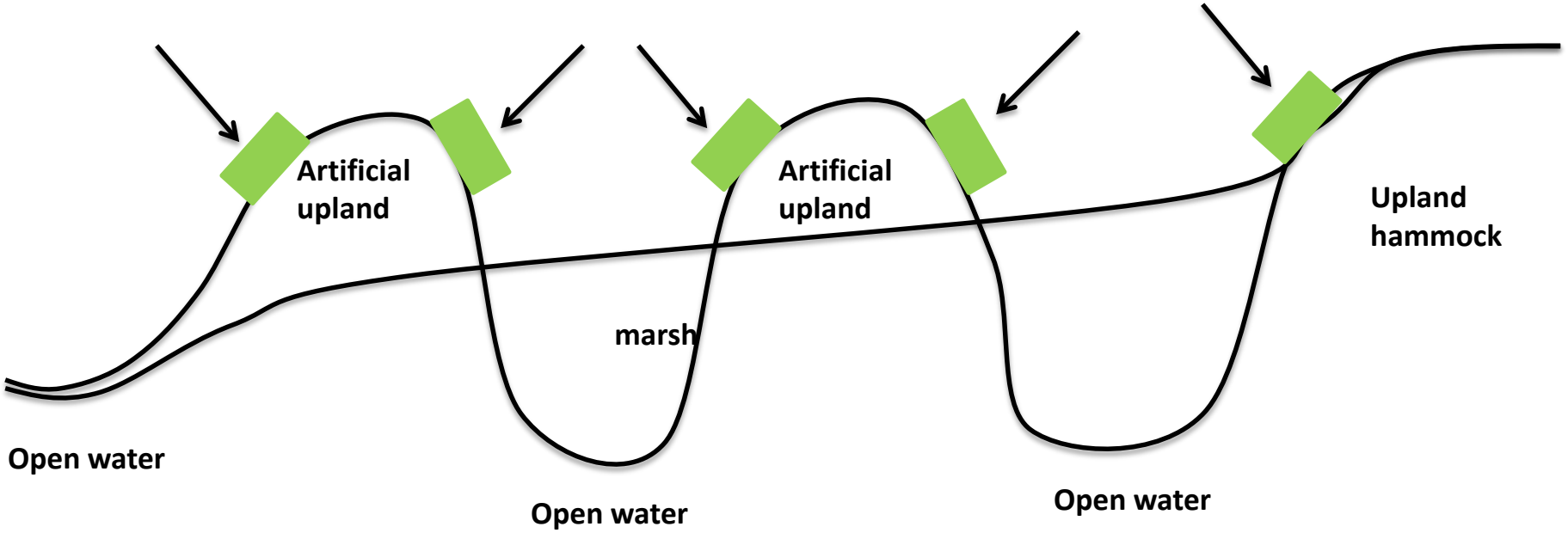
Pristine wetland

Mosquito Lagoon Natural Wetland Ecology

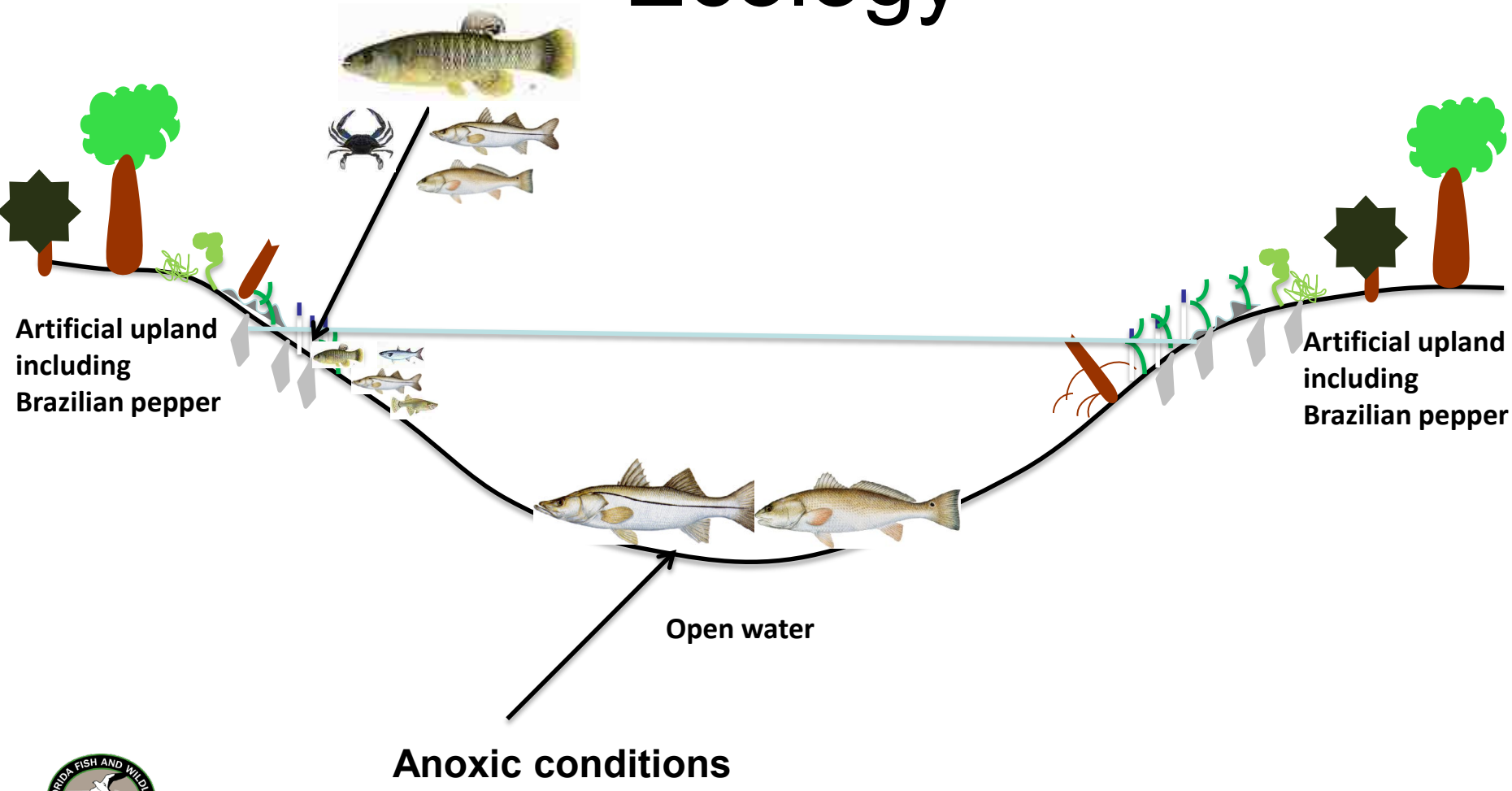


Mosquito Lagoon Dragline Ditching

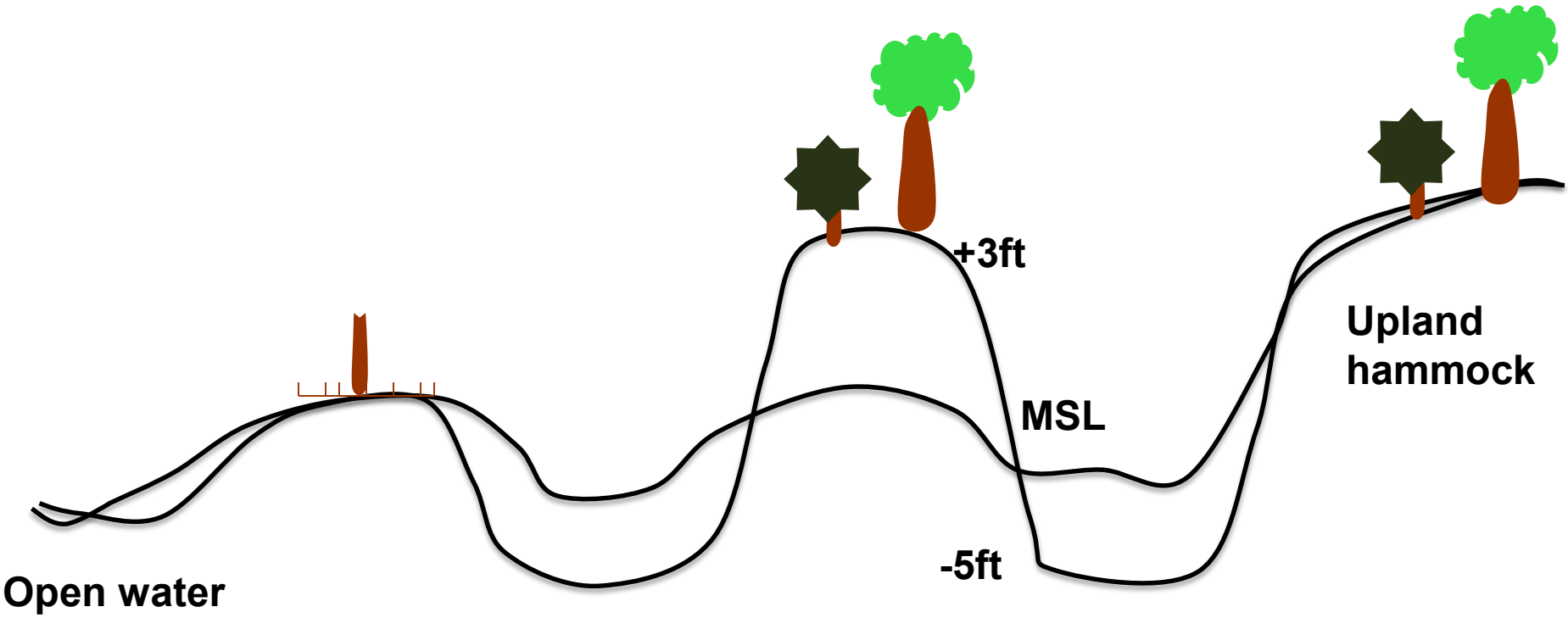
Wetlands?



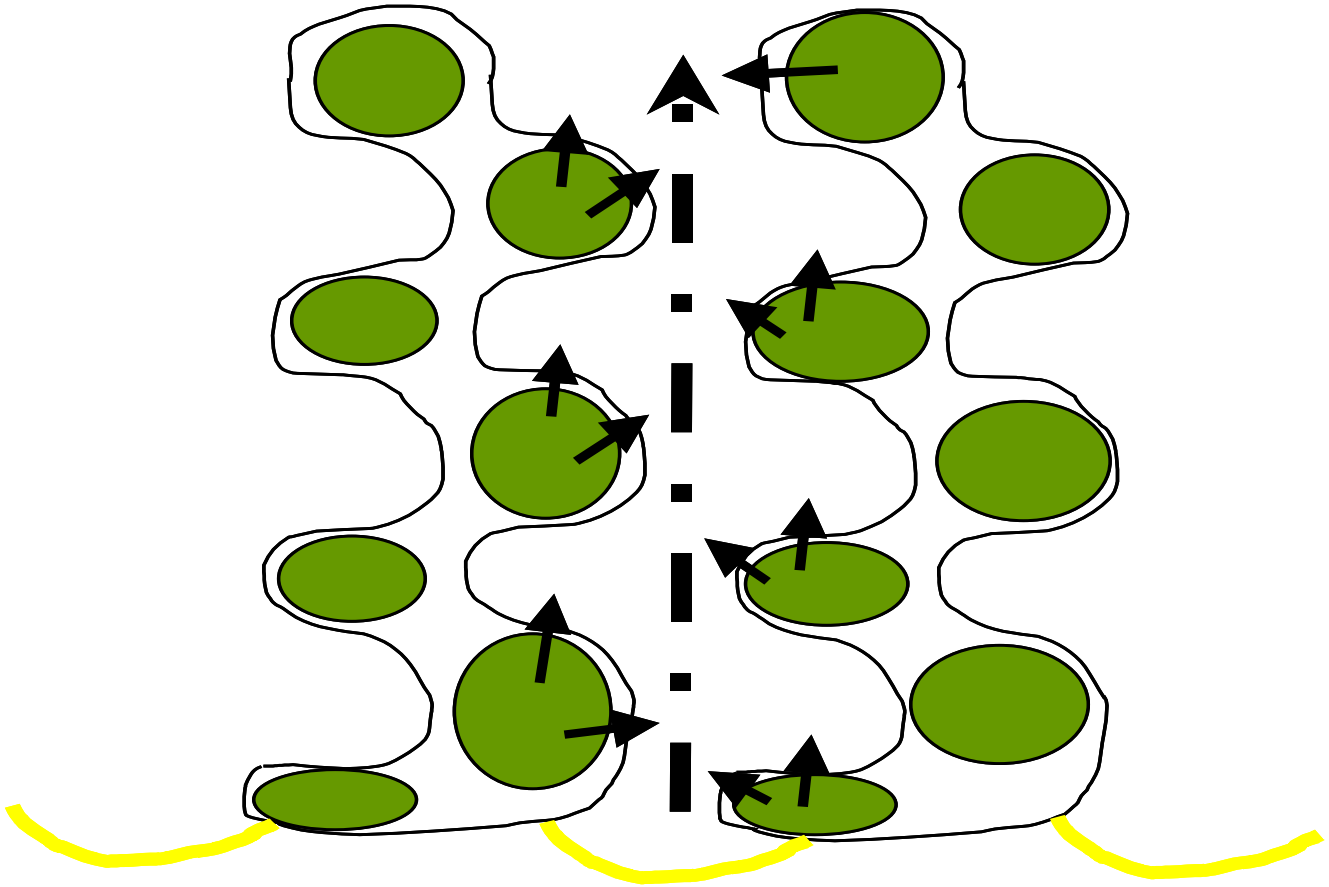
Mosquito Lagoon Dragline Ditch Ecology



Mosquito Lagoon Wetland Restoration



Dragline Ditch Restoration Technique



Spoil piles

Turbidity Screen

Excavator Path

Direction of Spoil Dispersal


CAT


Immediate post-restoration

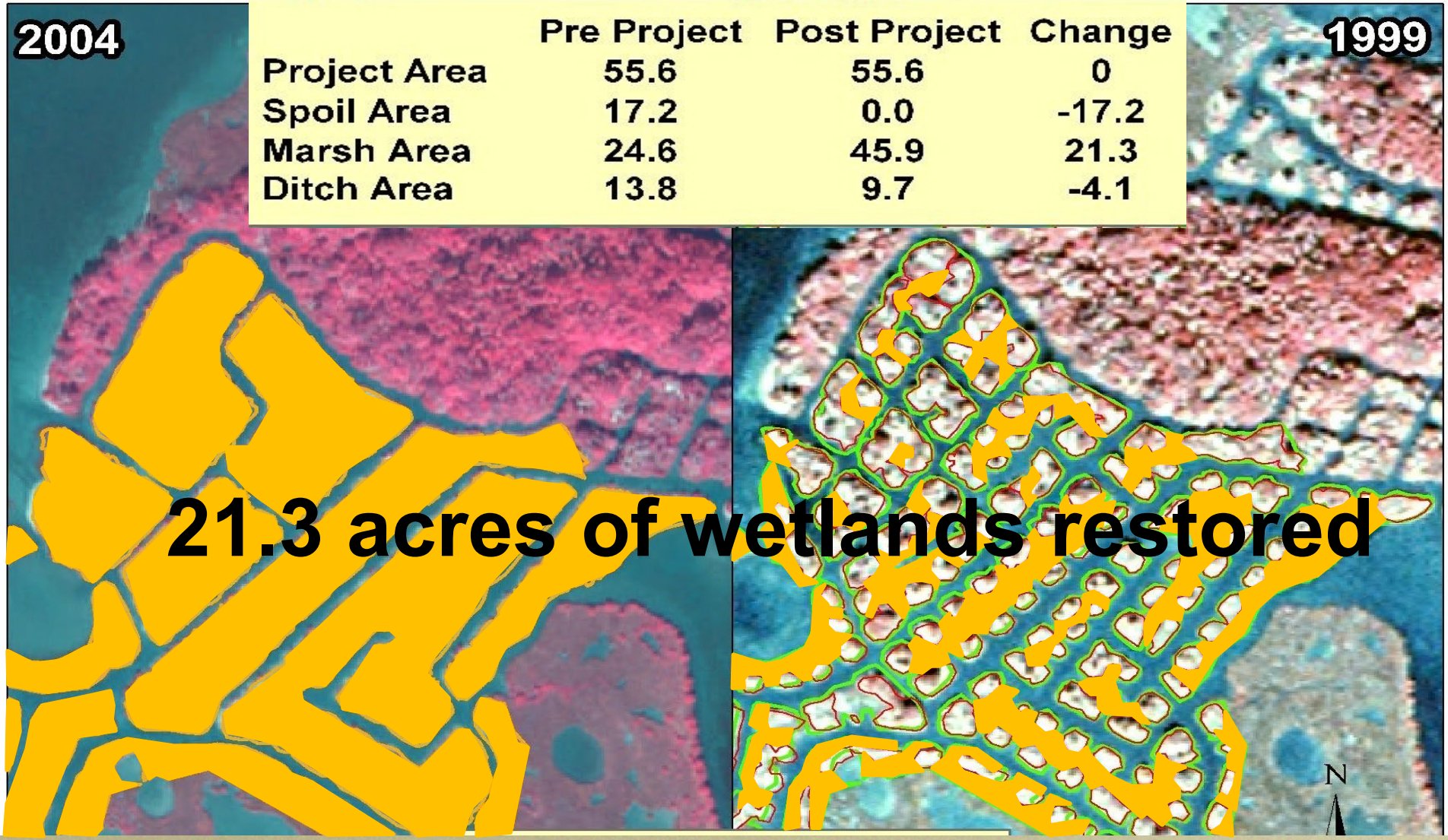

1-2 years

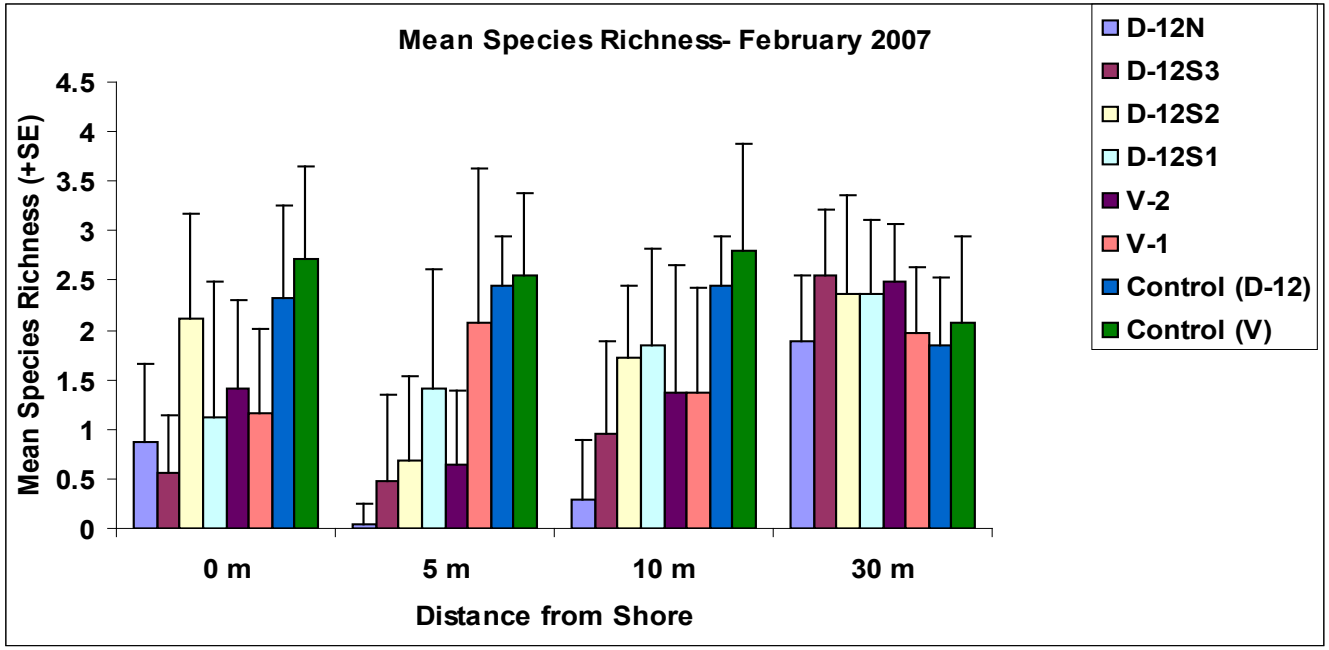

3-5 years


8 years


Dragline ditch


2yrs post-restoration


2004
1999
Pre Project Post Project Change
Project Area 55.6 55.6 0
Spoil Area 17.2 0.0 -17.2
Marsh Area 24.6 45.9 21.3
Ditch Area 13.8 9.7 -4.1
21.3 acres of wetlands restored
N
45.9 acres of wetlands
24.6 acres of wetlands

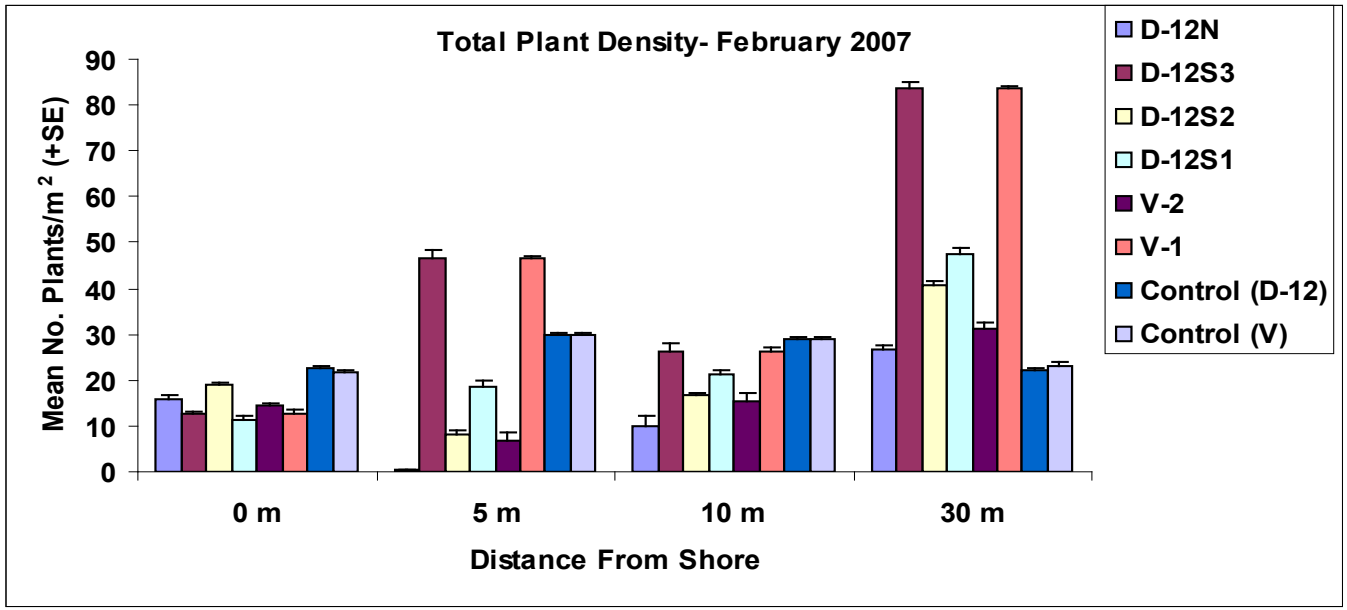


Youngest (1mth)

↓

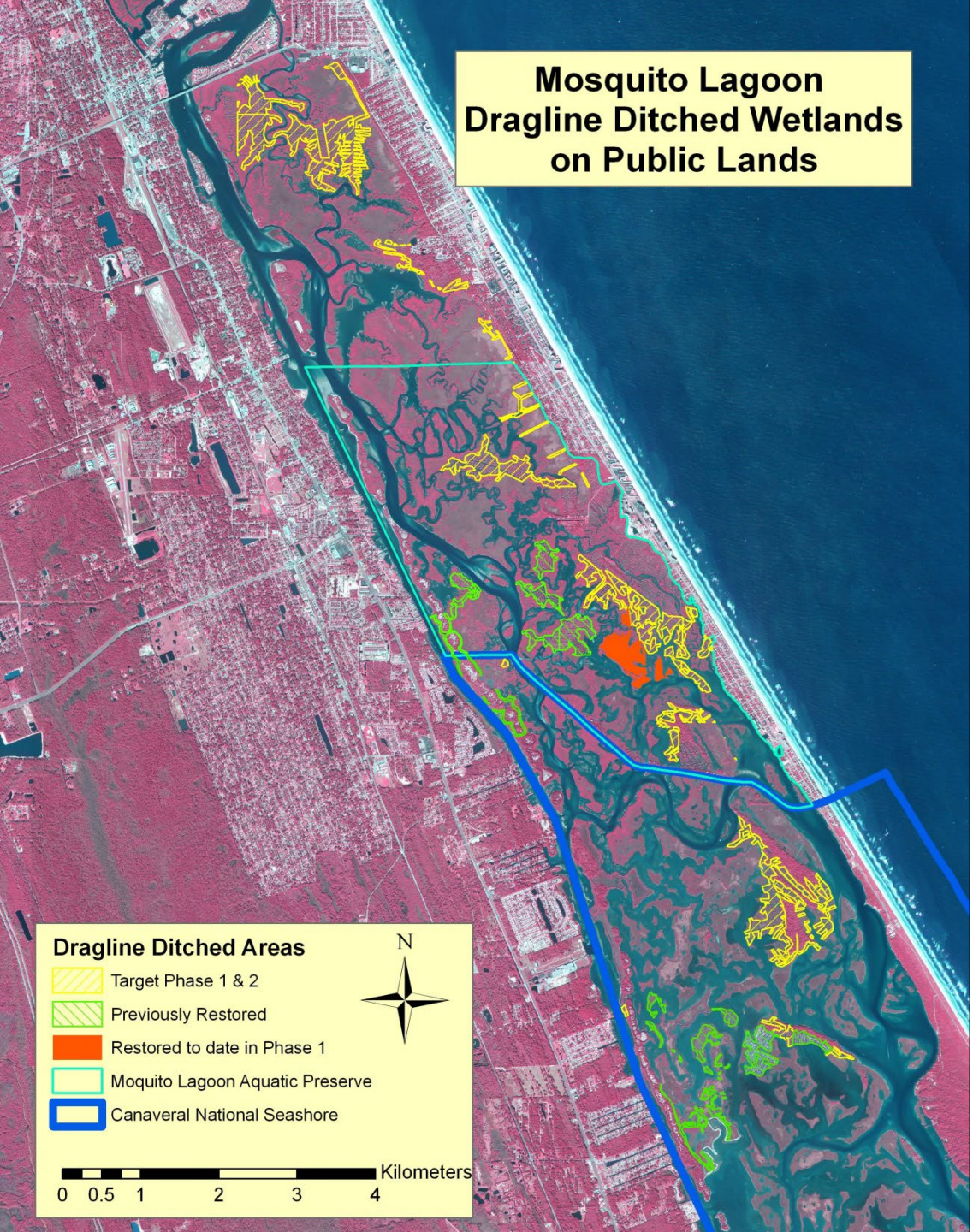
Oldest (8yrs)

Pristine wetlands



Donnelly, 2009


~$4500per acre to restore
Provides 50lbs of fish biomass per acre annually to adjacent waters Stevens et al. 2007
(600 restored acres produce 15tons annually)
Provides $13,400 per acre in coastal storm protection Costanza 2008
(600 restored acres provide $8,040,000 protection)



Dragline Ditch Restoration

Restoration has addressed approximately 625 acres in Volusia County

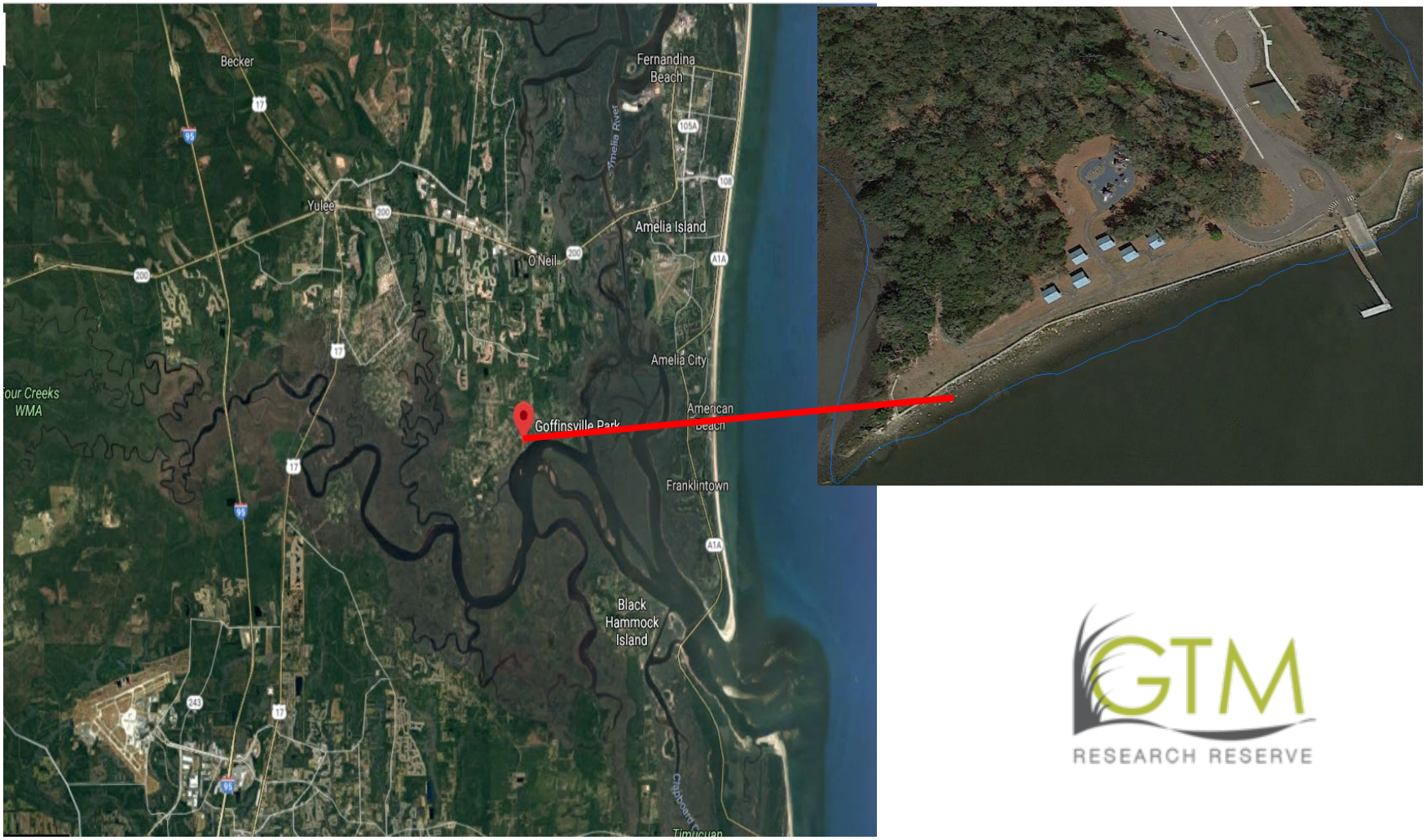
National Coastal Wetland Conservation Grants Program (USFWS) through FWC is funding the restoration

Phase 2 addresses an additional 93 acres in Flagler County


Bottle Island 2017 9yrs post-restoration
Write a description for your map.
Legend
Bottle Island
done 2008
Feature 1
done 2008
Bottle Island
N
Google Earth
500 ft


Matanzas Inlet
Write a description for your map.
Legend
Rattlesnake Island
Rattlesnake Island
5
A1A
Google Earth
Image © 2019 TerraMetrics
© 2018 Google
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
N
2 mi

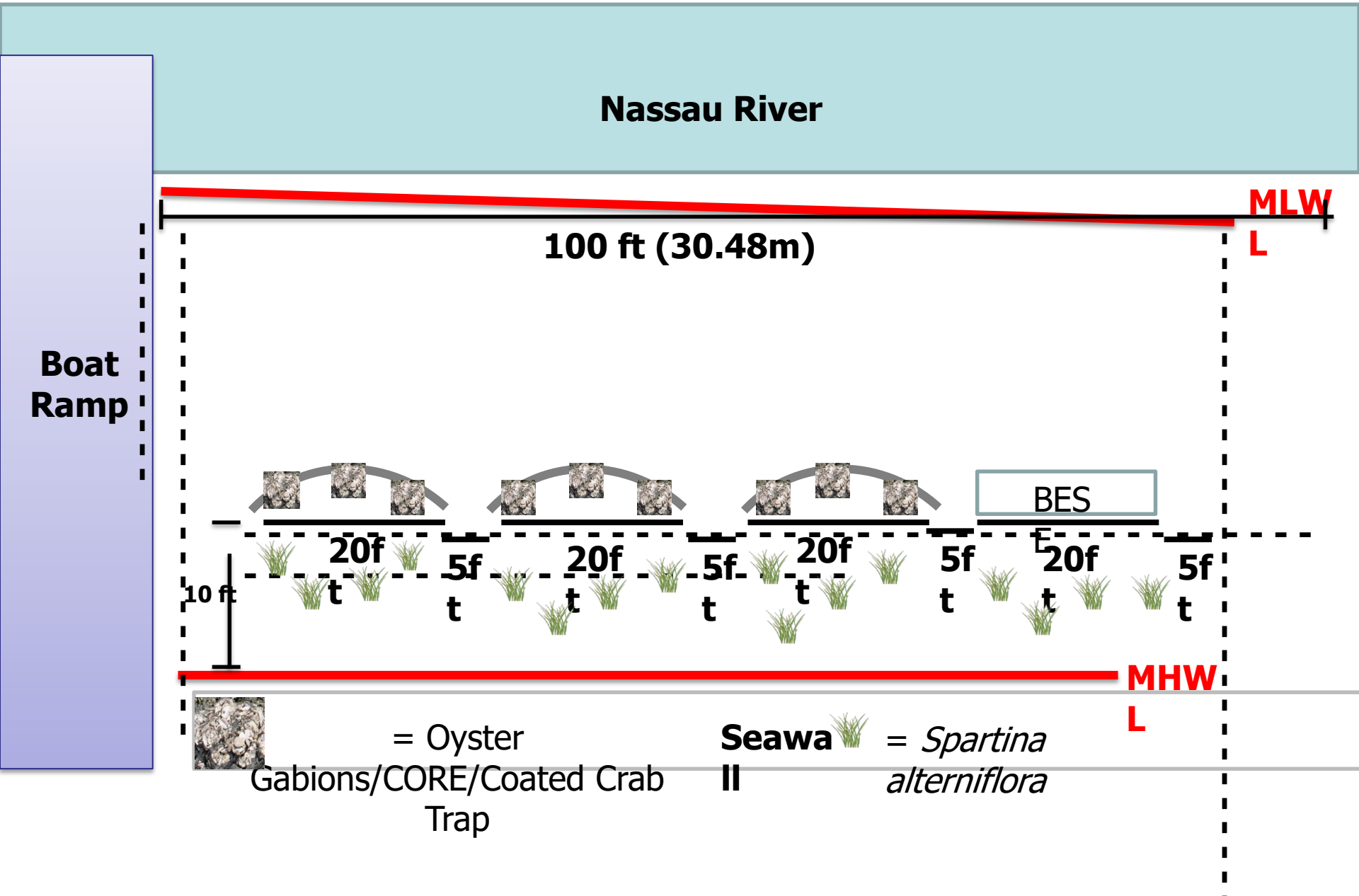
Goffinsville Park LS Project-Nassau River



GTM RESEARCH RESERVE

200ft successfully planted

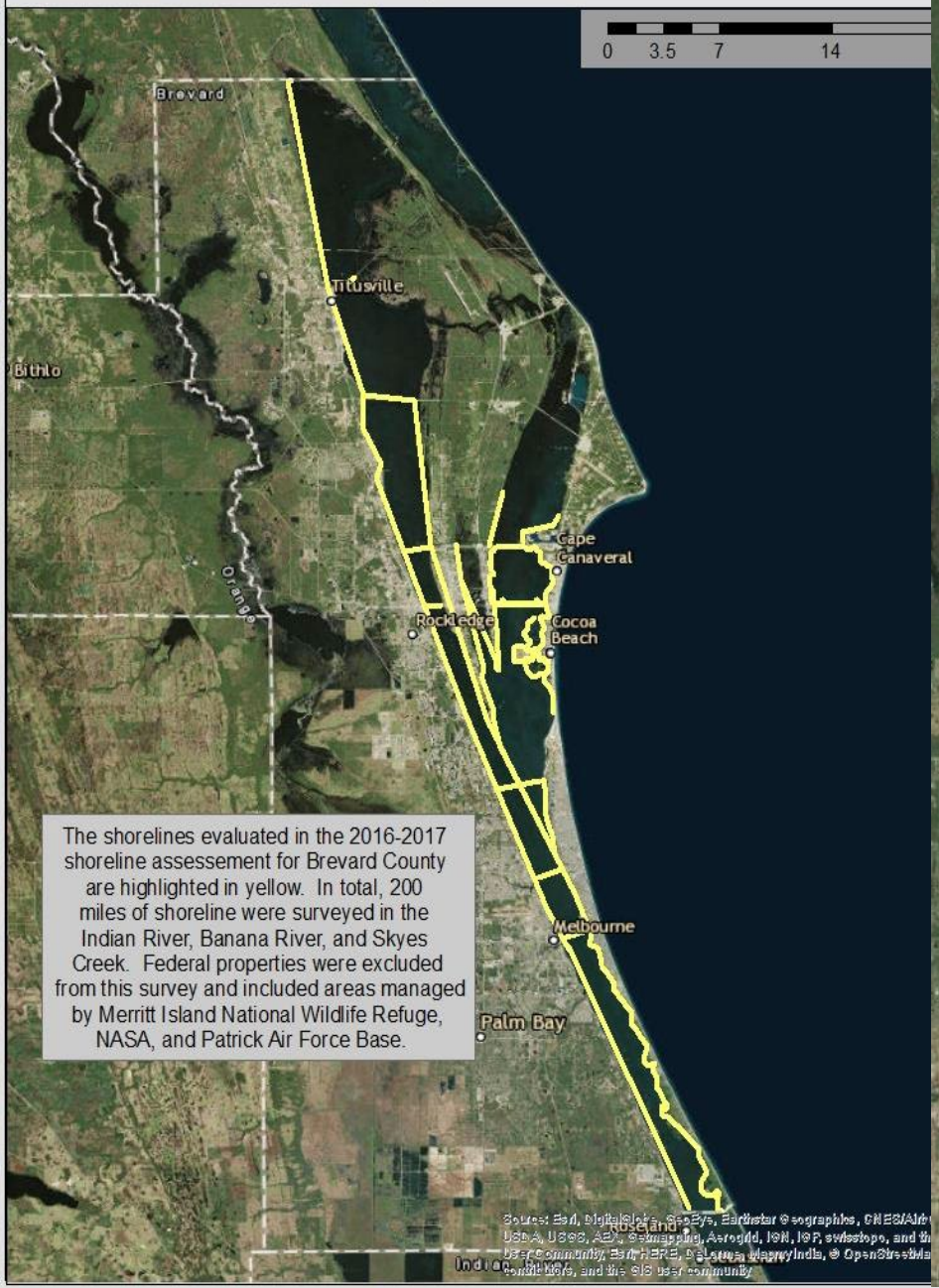
Other areas need more substantial measures


Nassau River
MLW
L
100 ft (30.48m)
Boat
Ramp
BES
20f
t
5f
t
20f
t
5f
t
20f
t
5f
t
20f
t
5f
t
10 ft
MHW
L
= Oyster
Gabions/CORE/Coated Crab
Trap
Seawa
ll
= Spartina
alterniflora

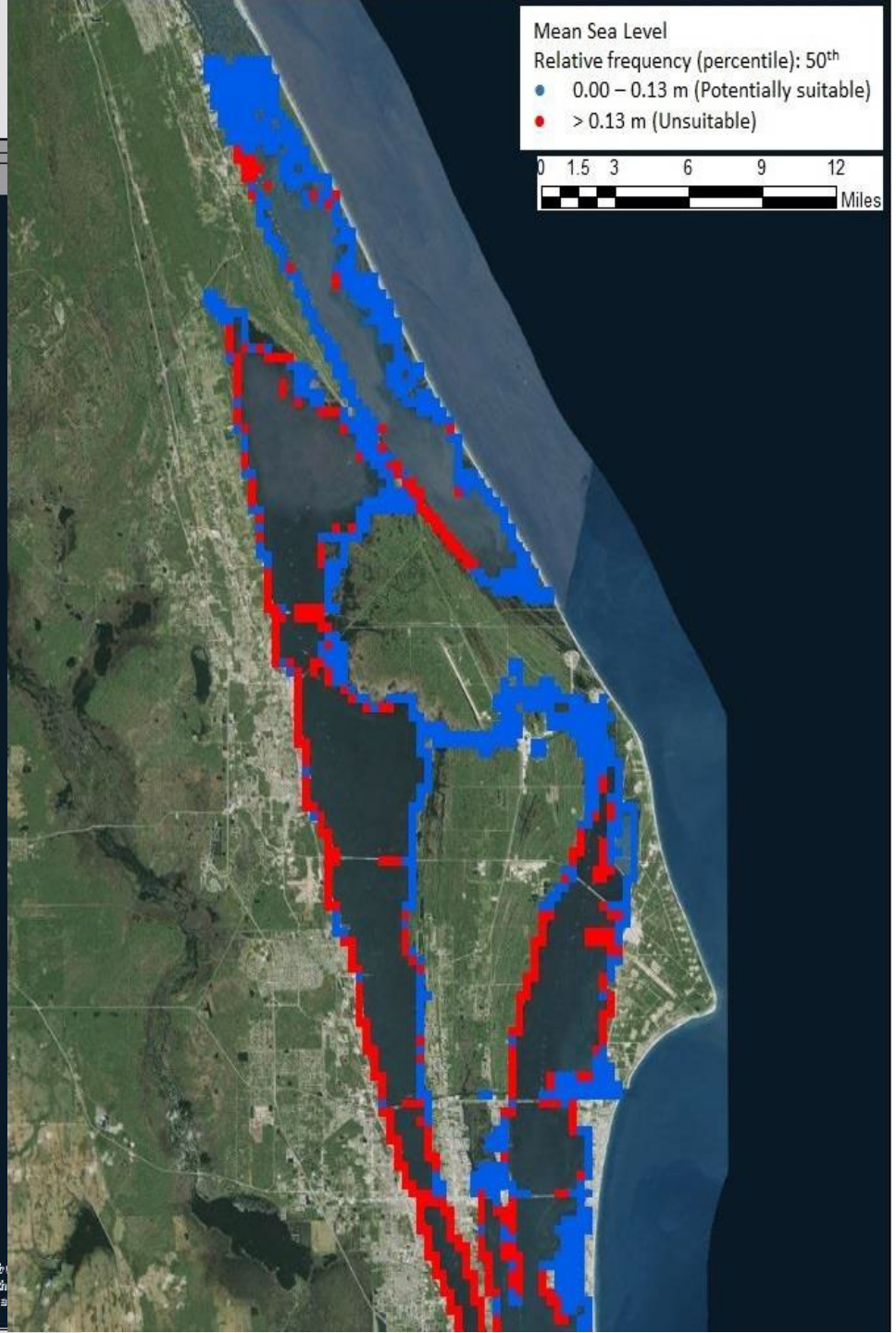
Goffansville Oyster Techniques

Shoreline Characterization

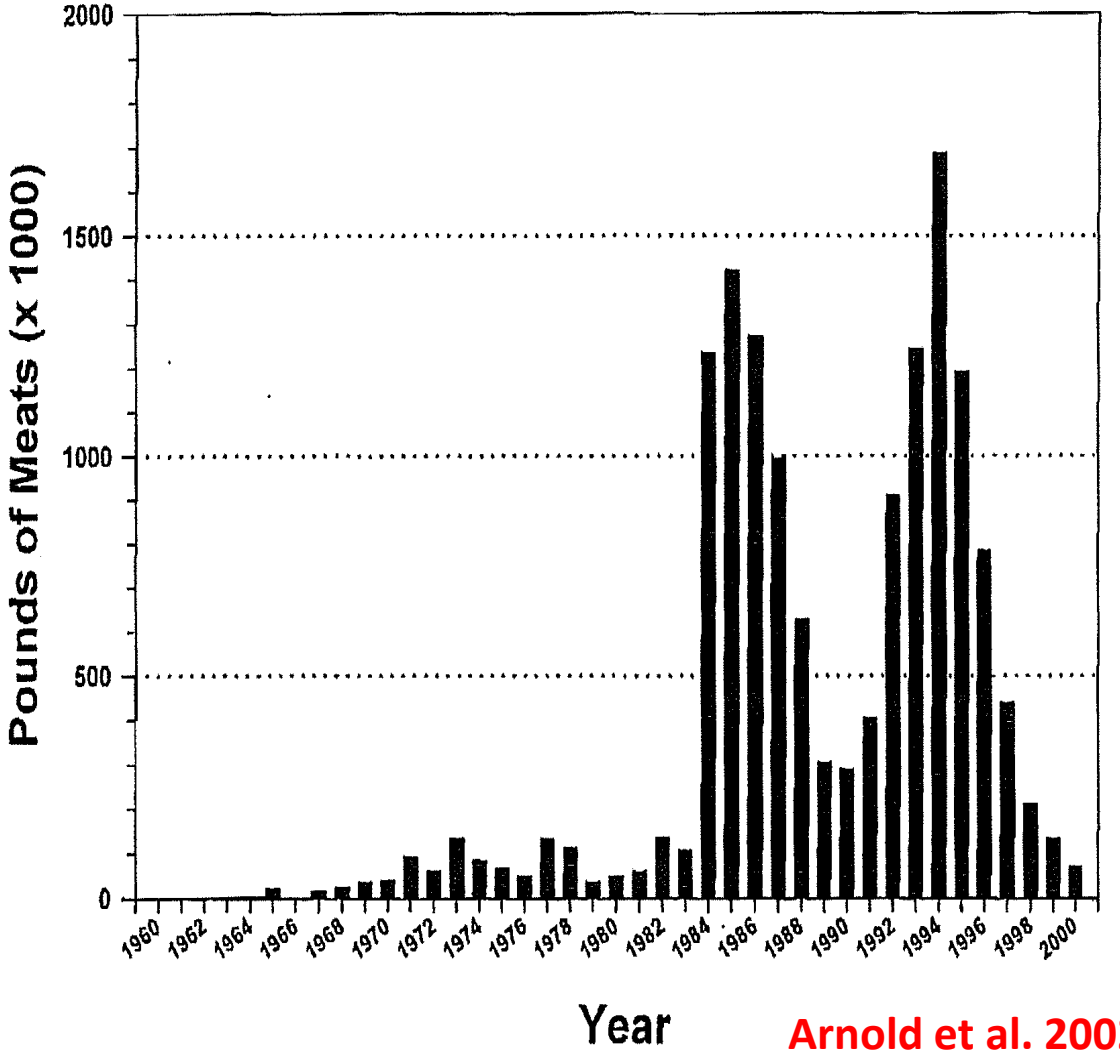
Brevard County Shoreline Assessment: Completed Area



The shorelines evaluated in the 2016-2017 shoreline assessement for Brevard County are highlighted in yellow. In total, 200 miles of shoreline were surveyed in the Indian River, Banana River, and Skyes Creek. Federal properties were excluded from this survey and included areas managed by Merritt Island National Wildlife Refuge, NASA, and Patrick Air Force Base.



IRL Hard Clam Harvest Landings 1960-2000



Arnold et al. 2002

Hard Clam Restoration

- **Survey extant population**
- **Collect resilient brood stock**
- **Assess physiology/genetics**
- **Culture and outplant**
- **Fate track**

COASTAL CONSERVATION ASSOCIATION FLORIDA

HARBOR BRANCH

FLORIDA ATLANTIC UNIVERSITY

Atlantic Coastal Fish Habitat Partnership Operations Budget Report
May 2019

January-December 2019	
Source	Grant Amount
NFHP FY18	$66,125
MSCG FY19	$10,000
Wallop-Breaux FY19	$27,895
NOAA mapping projects	$16,000
TOTAL	$120,020

January-December 2020	
Source	Grant Amount
NFHP FY19	$65,565
MSCG FY20	$25,000
Wallop-Breaux FY20	$28,680
Beyond the Pond	???
TOTAL	$119,275

**** ACFHP RepYourWaters fishing apparel generating $250-$500 per year***

Atlantic Coastal Fish Habitat Partnership Operations Budget Report
May 2019

January-December 2020	
Source	Budget Categories
NFHP Cooperative Agreement	Salary + Fringe + 1 SC Travel
Multistate Conservation Grant	Salary + Fringe + Angler Engagement Workshop
Wallop-Breaux/Sportfish Restoration Grant	Salary + Fringe + 1 SC Travel
RepYourWaters ACFHP account	Printing/Outreach/Schwag