



Update on Atlantic Coastal Fish Habitat Partnership Science and Data Initiatives

South Atlantic Fishery Management
Council Habitat Advisory Panel Meeting

St. Petersburg, Florida

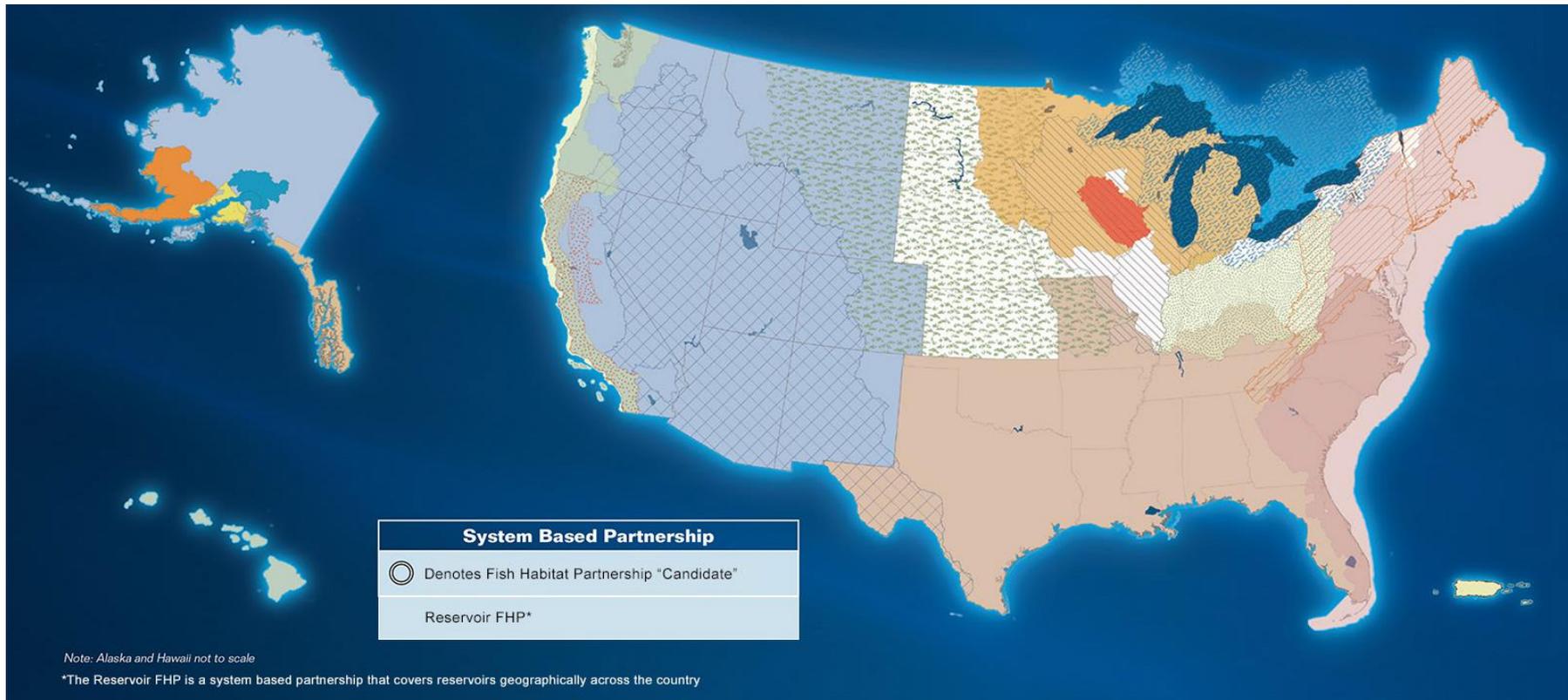
November 6 – 8, 2018

Lisa Havel, ACFHP Coordinator

A Quick Background...



- National Fish Habitat Action Plan developed in 2001
- Attempts to address loss & degradation of fish habitat
- 20 regional partnerships under national umbrella



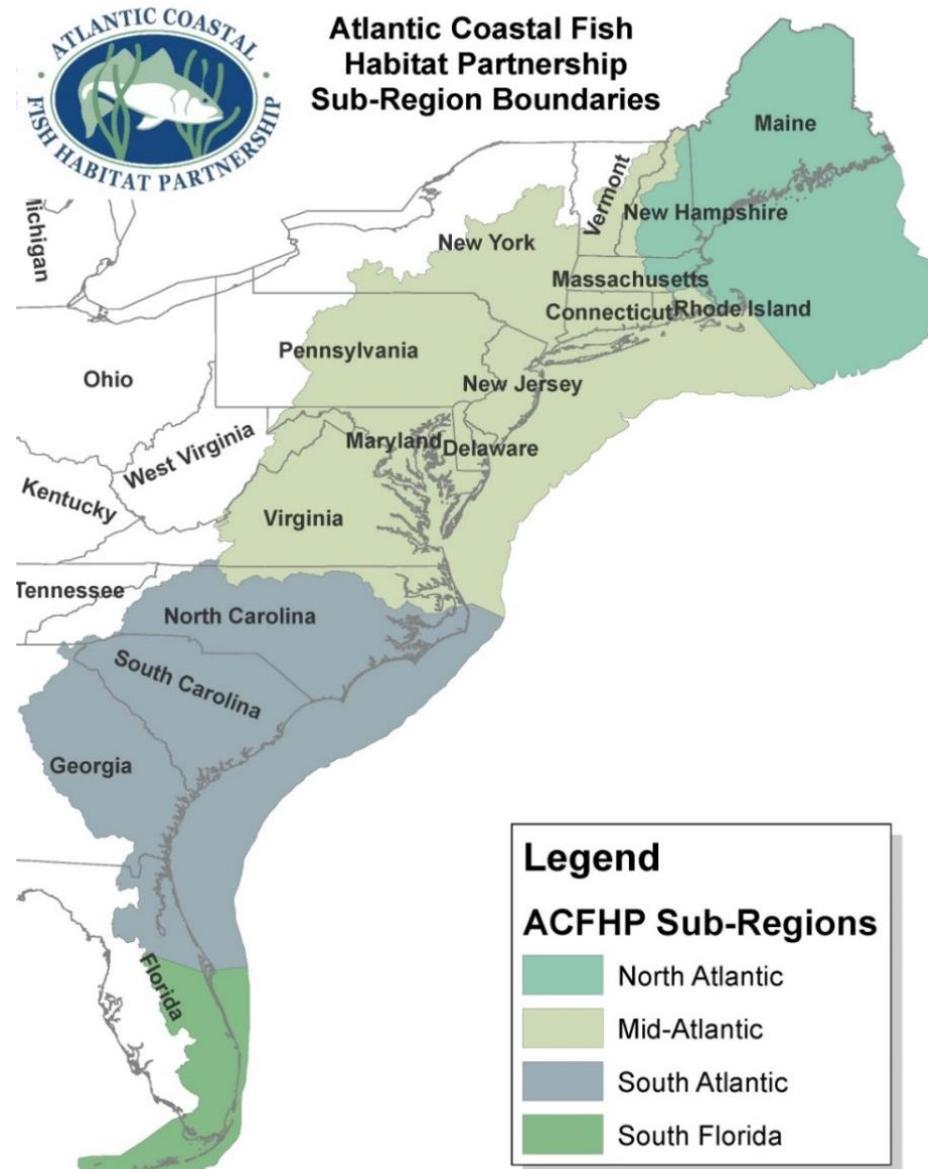
A Quick Background...



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...



The ACFHP Region

- Over 25% of the U.S. population
- Nine of the ten largest cities
- The largest metropolitan area
- The most densely populated coastal region
- The largest metropolitan area
- The only metropolitan area
- The largest metropolitan area
- The only metropolitan area
- Fish communities from temperate to tropical Atlantic
- Four national marine sanctuaries and one National Monument
- Most marine habitat of any Fish Habitat Partnership
- One of the most rapidly warming areas in the world

**Strong interactions
between people
and fish habitat**

A Quick Background...



Making the Connection

**From the headwaters to
the continental shelf**

**Between fish
and people**

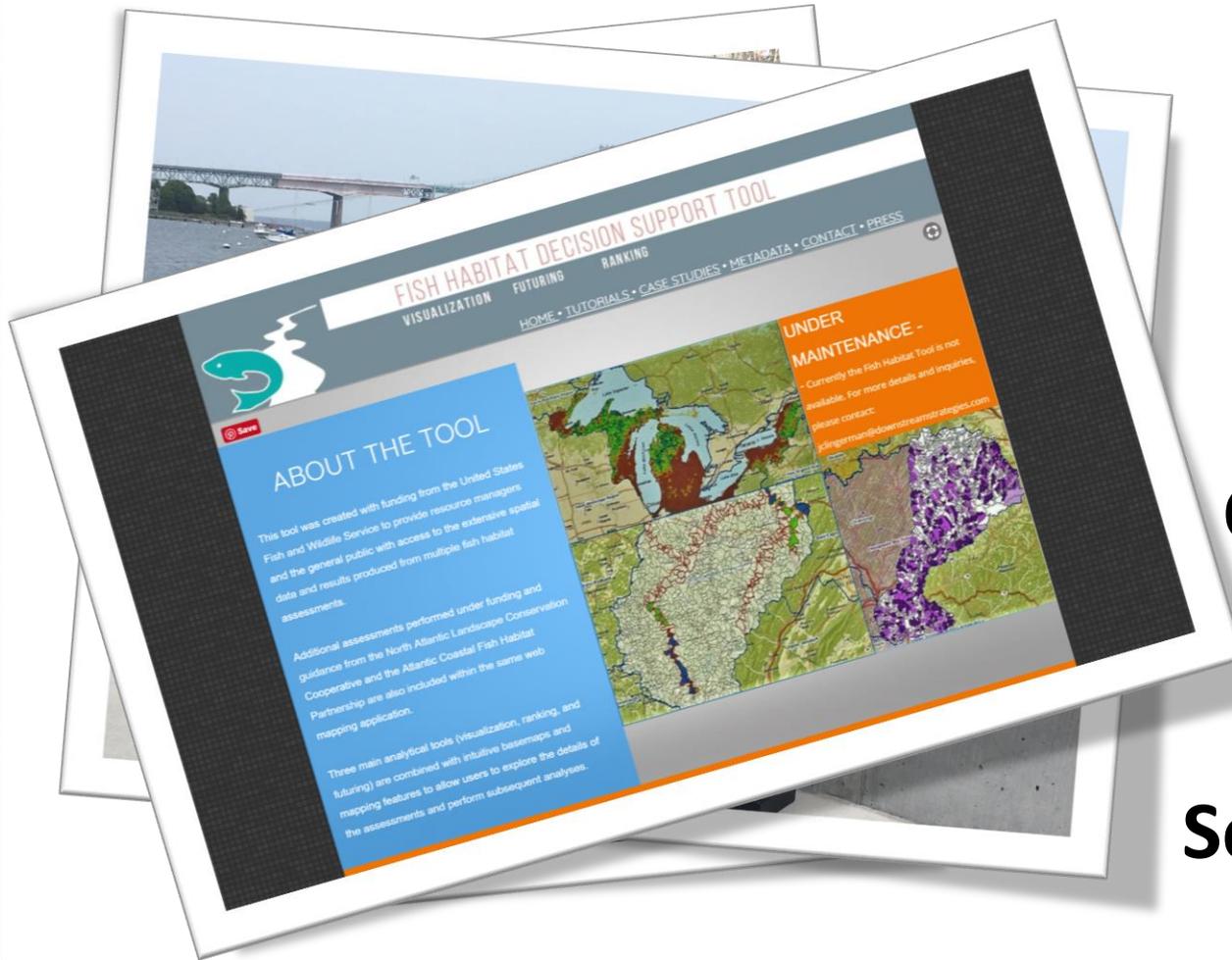
Among partners



A Quick Background...



Making the Connection



**On the Ground
Conservation**

**Outreach and
Communication**

Science and Data

A Quick Background...



ACFHP Accomplishments over past five years

- Coordinated the development of the estuarine and diadromous portions of the Fish Habitat Decision Support Tool
- Opened 75 river miles and restored over 25 acres of SAV, tidal vegetation, and oyster reefs
- Increased communication and collaboration among over 60 different federal, state, county, local, academic, tribal, non-profit, private, and conservation entities
- Contributed over \$400,000 directly to conservation projects, leveraging over \$4 for each ACFHP restoration dollar
- Added an estimated \$41 million economic value to the Atlantic Coast
- Published Species-Habitat Matrix*

Species-Habitat Matrix



- 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

Species-Habitat Matrix



- The Species-Habitat Matrix is **not**:

An assessment of either the status or the full ecological importance of these habitats in terms of:

- Nutrient processing
- Securing sediments
- Maintaining water quality (filtration, etc.)
- Broader trophic linkages

Species-Habitat Matrix

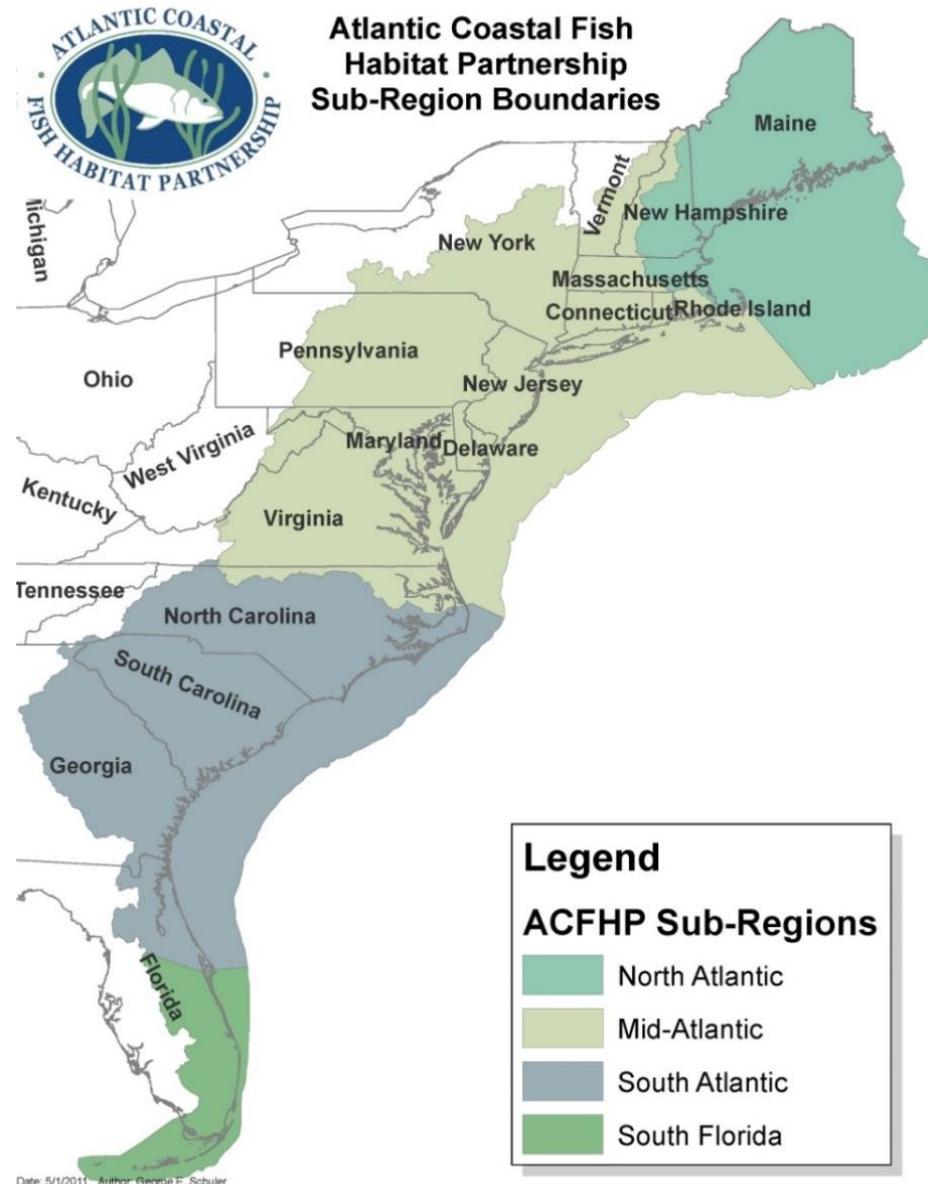


- The Species-Habitat Matrix does **not address**:
 - All species or habitats
 - The natural rarity of a habitat type
 - Habitat trends
 - Pelagic habitats

Species-Habitat Matrix



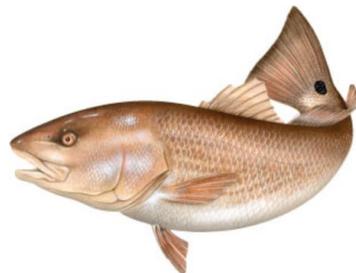
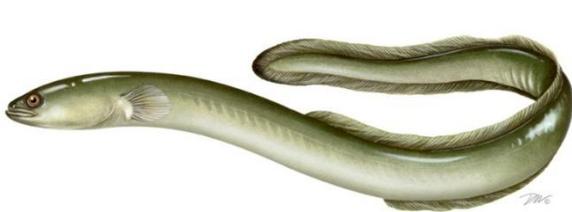
- Separate matrices for 4 subregions
 - Different geographical assemblages
 - Geographic variation in habitat use (and availability)
- Regional leads assembled teams of experts, each assigned a set of species



Species-Habitat Matrix



- 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



Species-Habitat Matrix



- Life stages

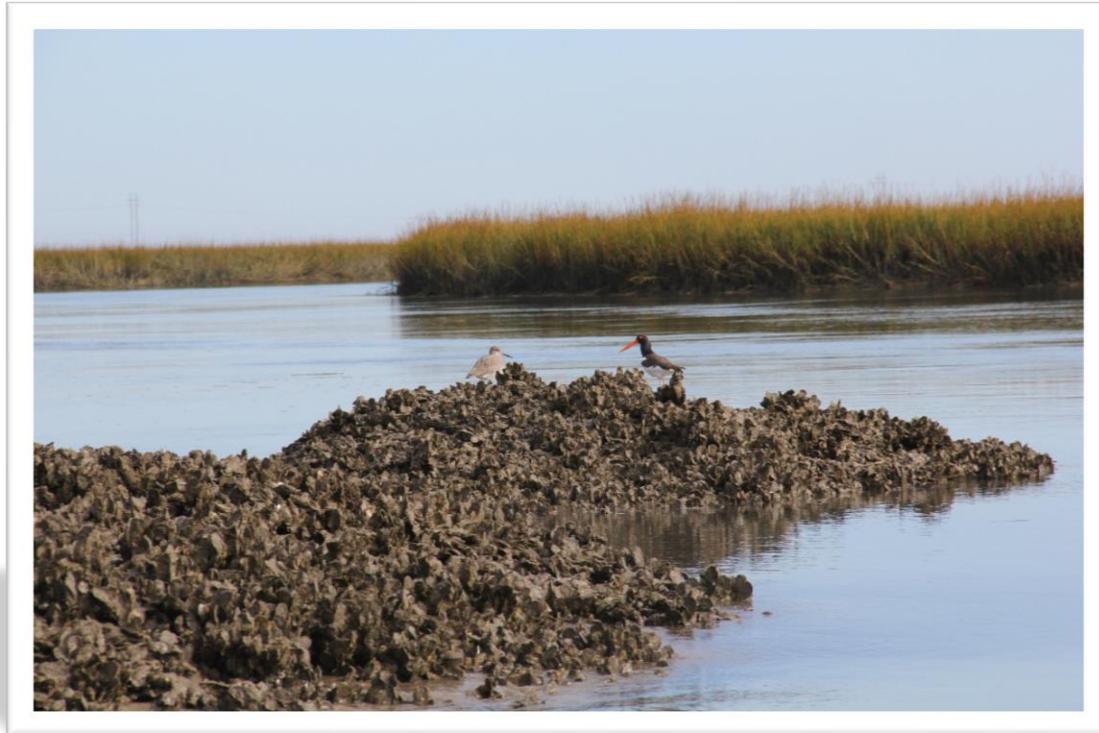
- Eggs – Larvae
- Juvenile/Young of Year (YOY)
- Adults
- Spawning Adults
 - Only if fundamentally different from adult, non-spawning habitat

Species-Habitat Matrix



Habitats

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



Species-Habitat Matrix



Habitats

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



January Murray



Habitats

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



Species-Habitat Matrix



Habitats

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



January Murray

Species-Habitat Matrix



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



Species-Habitat Matrix



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



Species-Habitat Matrix



Scoring and analysis

- 1 team lead + team members for each region
- Each finding was cited at least once
- Team lead compiled and combined results for 1 matrix/region
- 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

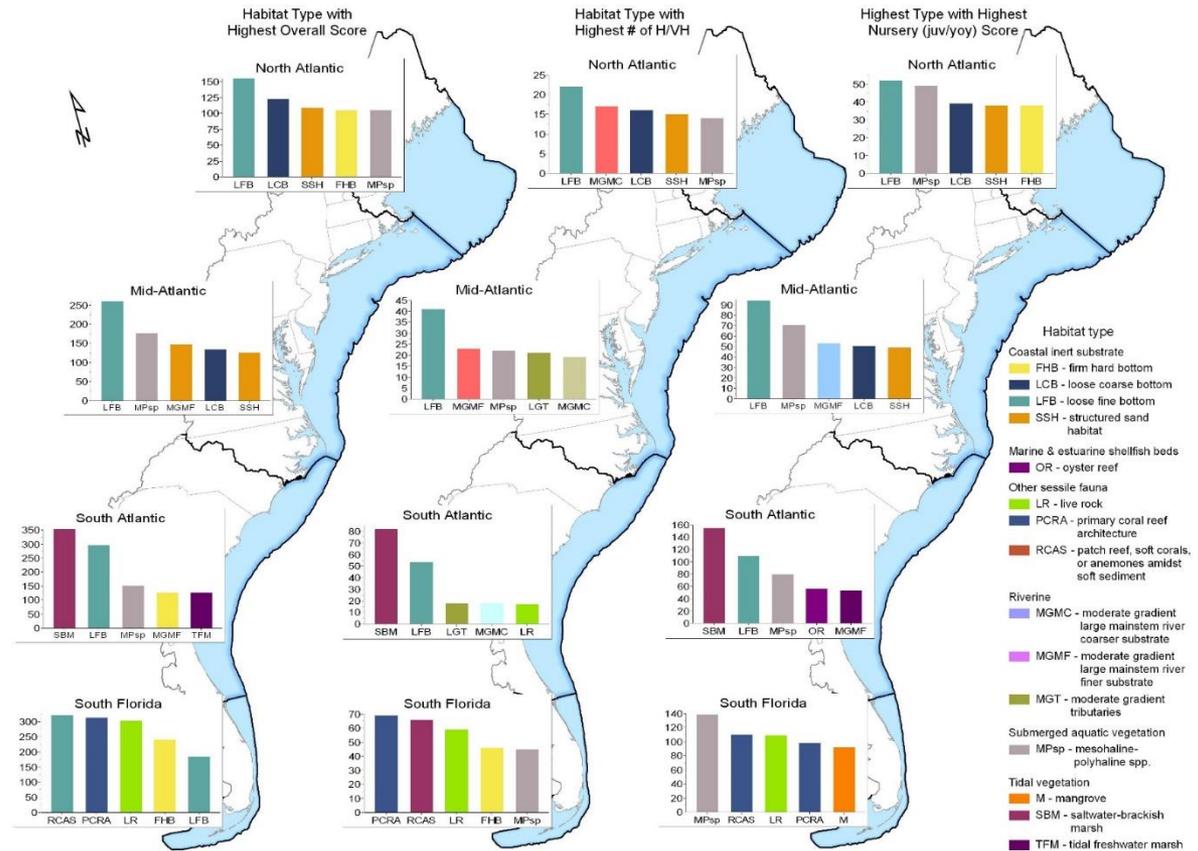
| | | American Shad | | | |
|------------------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| Habitat Category | Habitat Type | Eggs/Larvae | Juveniles | Adults | Spawning Adults |
| Shellfish Beds | Oyster reef | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Scallop Beds | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Hard shell clam beds | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Coral reefs | Scleractinian corals | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Soft corals and anemones | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Macroalgae | Fucus, Laminaria, Ulva lactuca mats | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Submerged Aquatic Vegetation (SAV) | Tidal fresh & oligohaline spp. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | Mesohaline-Polyhaline spp. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Species-Habitat Matrix



Publication

- *BioScience* April 2016
- Kritzer et al.



Species-Habitat Matrix



Online Query Database

- Available December 2018

QMAKING THE CONNECTION.

[Home](#) [About Us](#) [Priority Habitats](#) [Our Work](#) [Get Involved](#)

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 |
|----------------------|----------------------|--------------------------|---|--------------------------|----------------------|--------------|
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> | |
| Alewife | Mid Atlantic | Coastal Inert Substrates | Firm Hard Bottom (boulders to embedi | Juvenile & Young-of-Year | Medium | 2.00 |
| Alewife | Mid Atlantic | Coastal Inert Substrates | Firm Hard Bottom (boulders to embedi | 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 |

Species-Habitat Matrix



| Species | Region | Habitat Category | Habitat Type | Life Stage | Rank | Numeric Rank |
|--------------------------|---|--|-----------------------------------|---|--------|--------------|
| | <ul style="list-style-type: none"> * South Atlantic * South Florida | <ul style="list-style-type: none"> * Submerged Aquatic Vegetation | | <ul style="list-style-type: none"> * 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 |

Priority Habitats



North Atlantic

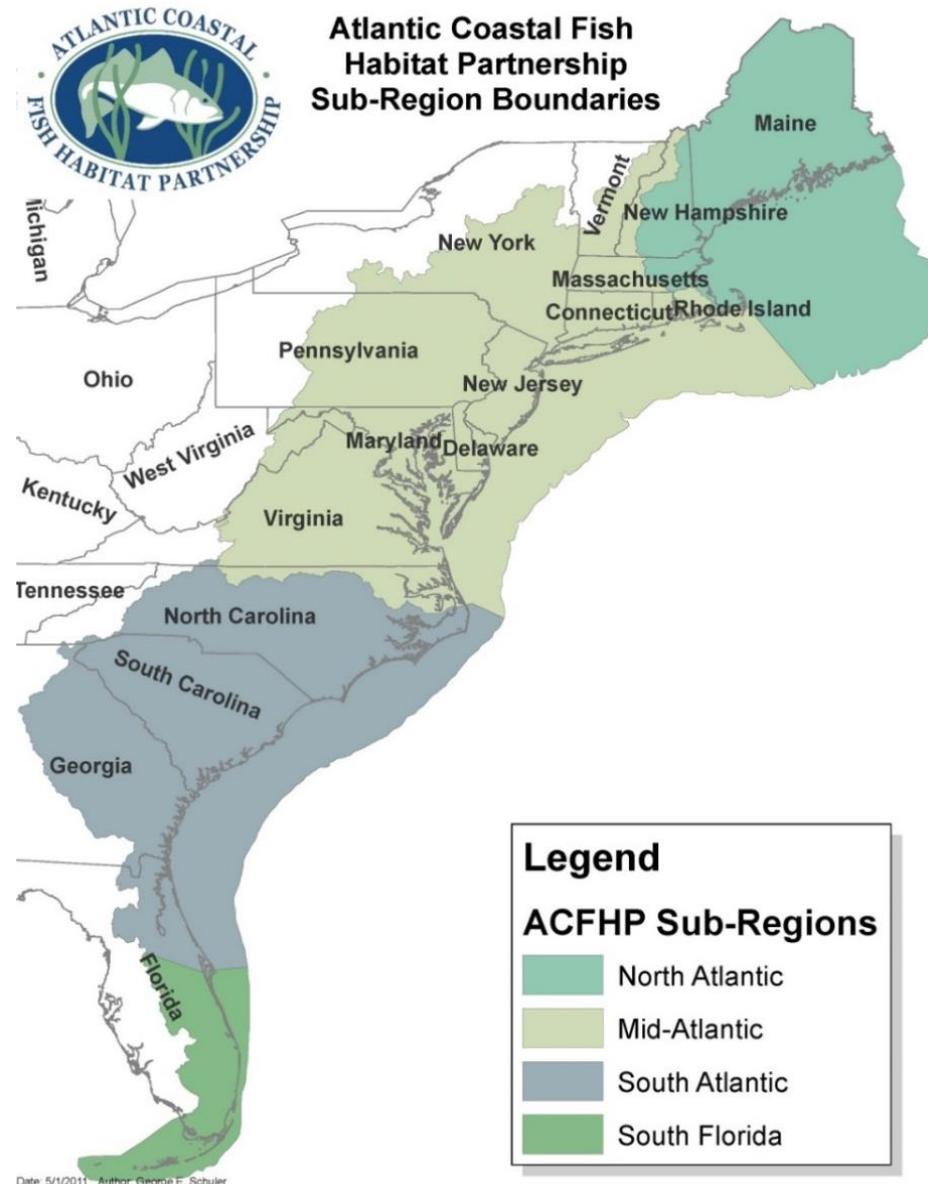
- Riverine bottom
- Shellfish beds
- SAV

Mid- & South Atlantic

- Riverine bottom
- Shellfish beds
- SAV
- Tidal vegetation

South Florida

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





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

Expected Outcome

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



Compile existing GIS layers and maps

- List of over 100 data layers covering the Southeast
 - Habitats (e.g. artificial reefs and benthic cover)
 - Indicators (e.g. EFH areas, marsh extent, coastal condition)
 - Threats (e.g. 303(d) sites and impervious surface)
 - Fish presence (e.g. acoustic tagging, trawl data)



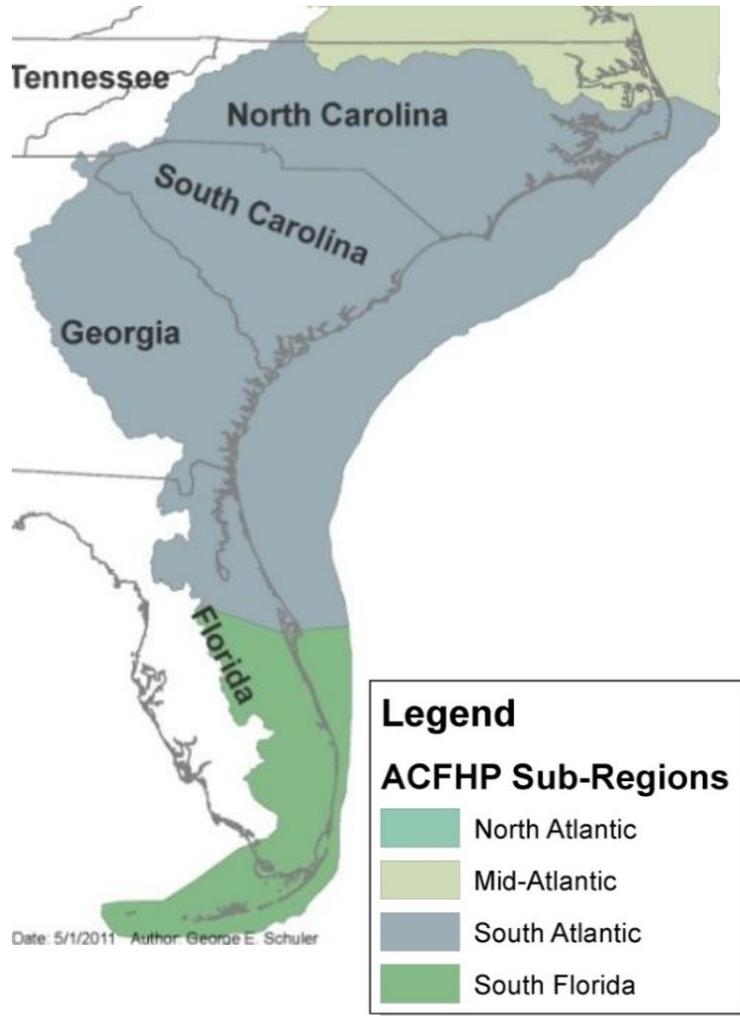
Compile existing GIS layers and maps

- Marine Cadastre
- South Atlantic LCC
- State agency layers
- US Fish and Wildlife Service
- EPA
- SAFMC
- SEACAP
- SECOORA
- USGS
- SERO
- TNC
- NFHP

SE Fish Habitat Conservation Mapping



Scope



Mid- & South Atlantic

- Riverine bottom
- Shellfish beds
- SAV
- Tidal vegetation

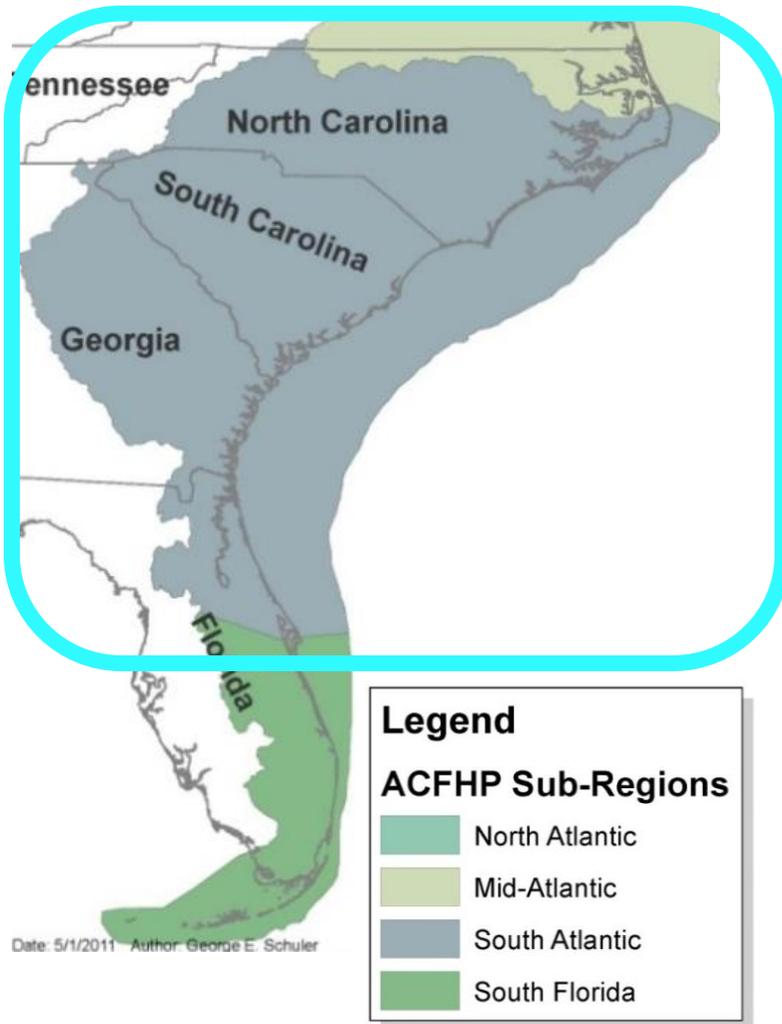
South Florida

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

SE Fish Habitat Conservation Mapping



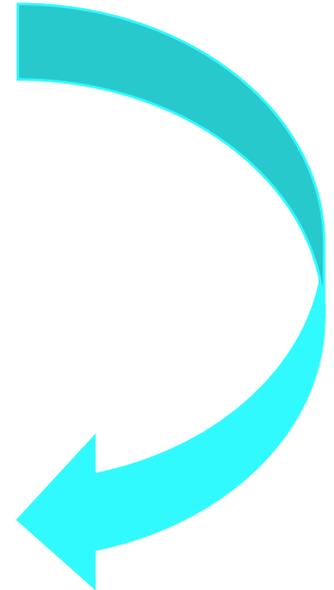
Scope



Northern Scenario

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

**Diadromous
assessment**



SE Fish Habitat Conservation Mapping



Scope



Northern Scenario

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

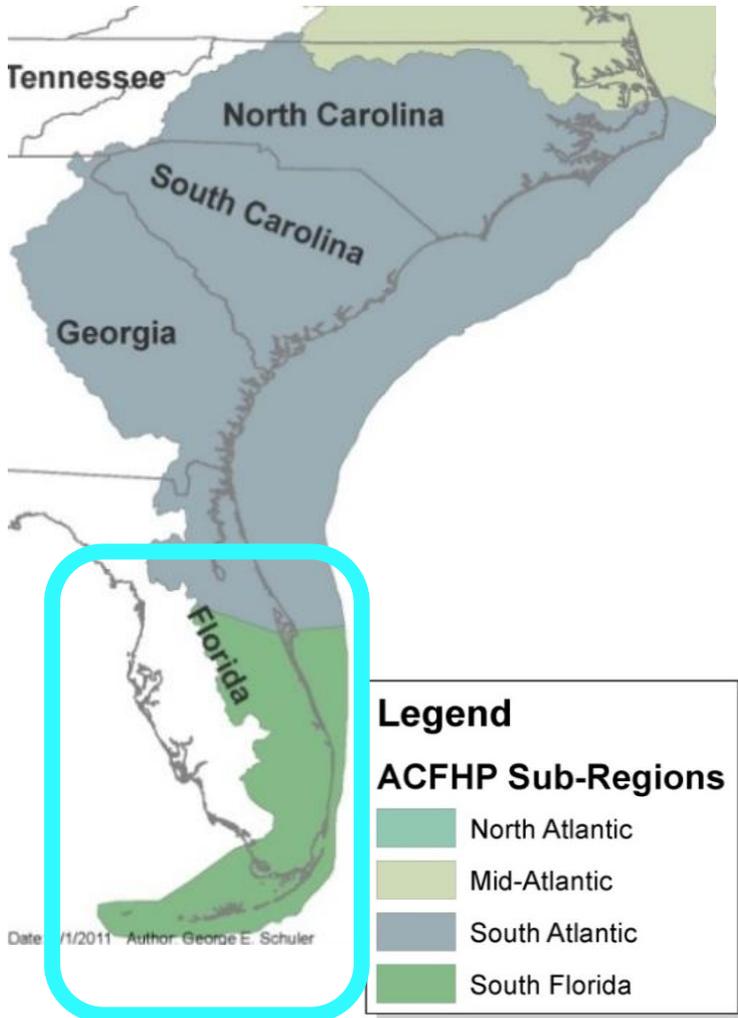
**Estuarine
assessment**



SE Fish Habitat Conservation Mapping



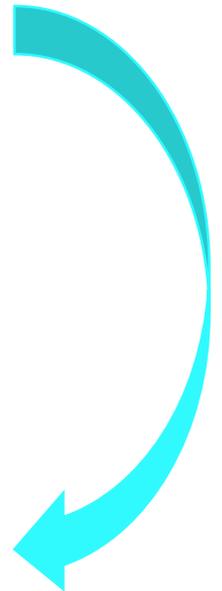
Scope



Southern Scenario

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

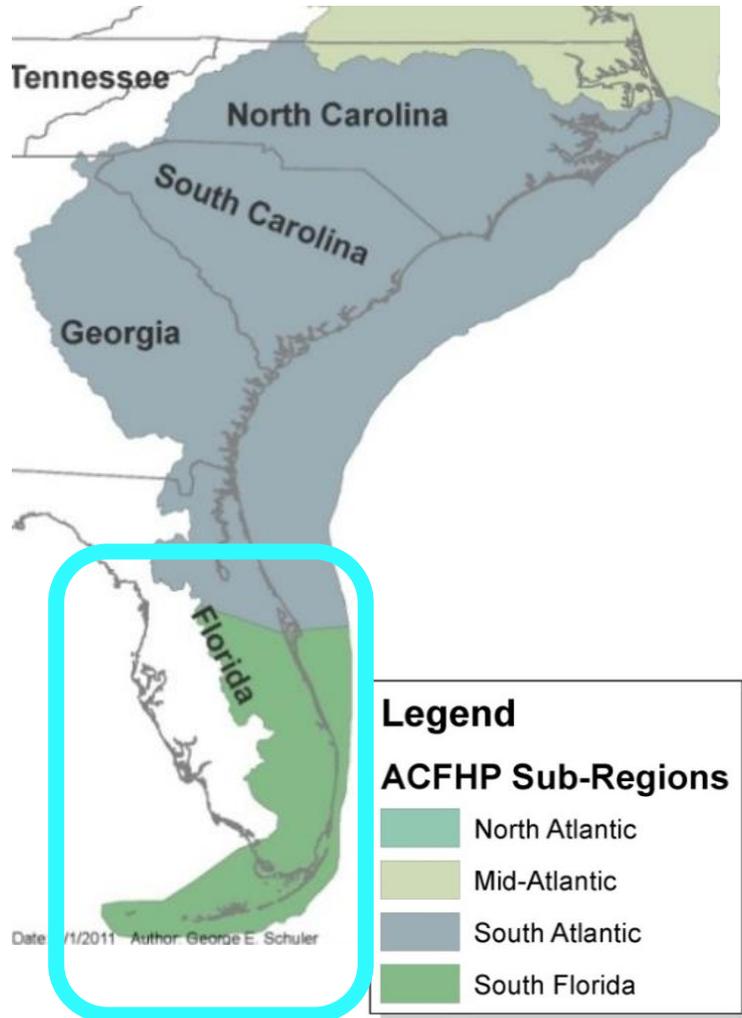
Estuarine
assessment



SE Fish Habitat Conservation Mapping



Scope



South Florida

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

**Coastal
assessment**





Scope

- Northern diadromous scenario
 - NHD catchment in watersheds with diadromous fish or drained into them
- Northern and southern estuarine scenario
 - 1-km² hexagon
- Southern coastal scenario
 - 10' squares



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

SE Fish Habitat Conservation Mapping



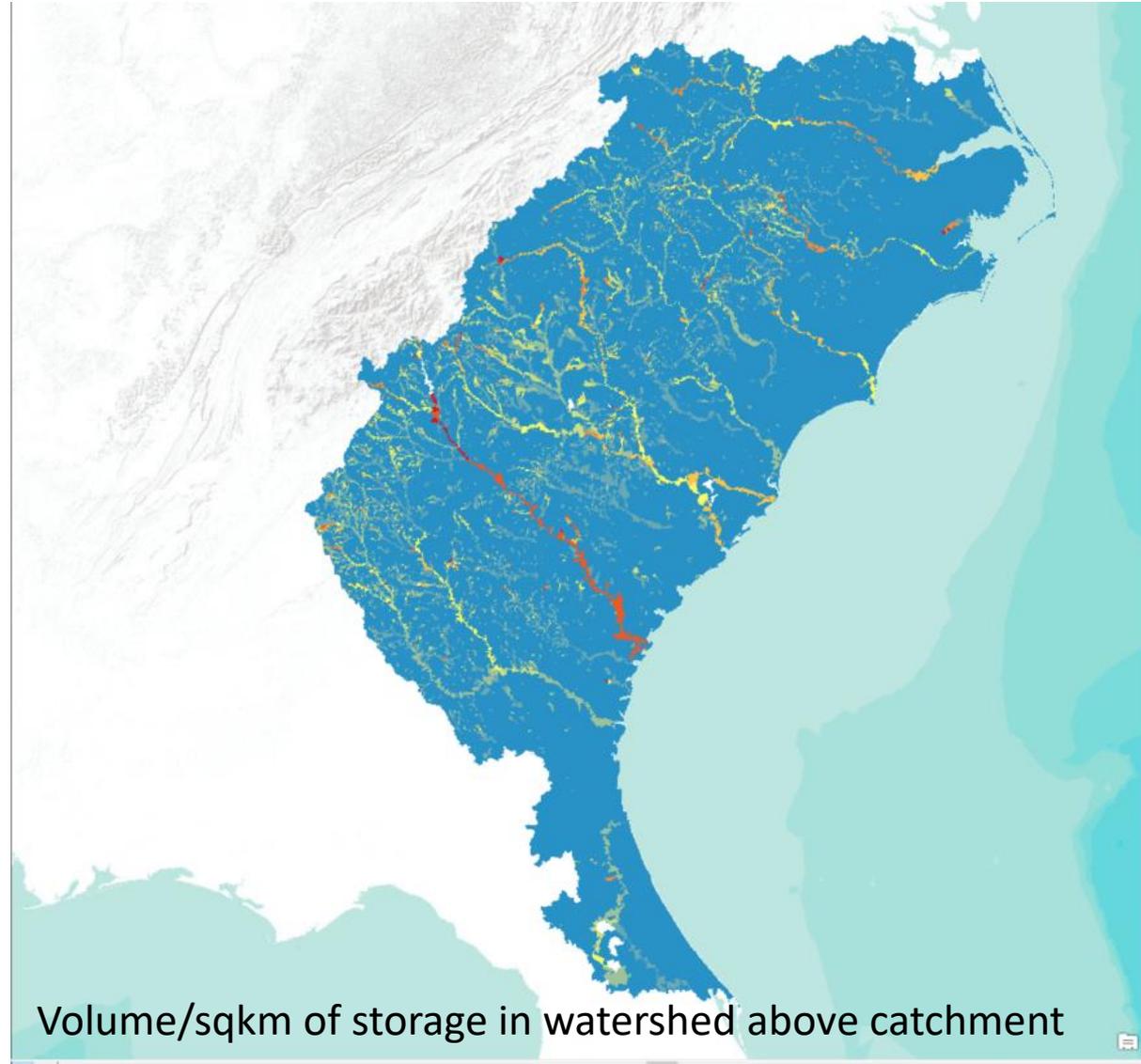
Diadromous Assessment

| Variable | Measurement | Metric |
|------------------------------|--|--|
| Impervious Surface | % of area above the catchment that is impervious surface | 10 points if <5% |
| Point Source Pollution | Density of sites in catchment | 10 points if ranked lowest 25% for pollution (least polluted) |
| Non-point Source Pollution | % of catchment covered by agriculture | 10 points if catchment is ranked lowest 25% for pollution (least polluted) |
| Riparian Buffers | % of floodplain area with natural landcover | 10 points if catchment is ranked top 25% for natural coverage |
| Potential for species access | Reaches (1) with ocean connectivity x # of species in the catchment | 10 points if catchment is ranked in top 25% |
| Water Usage | Volume all reservoirs (NID_STORA in NID) per unit area of watershed (cubic meters/square km) | 10 points if catchment is ranked in top 25% for lowest volume. |
| Fragmentation | Density of road crossings + dams in catchment | 10 points if catchment is ranked lowest 25% for fragmentation (least amount of dams and crossings) |
| Sturgeon Critical Habitat | Sturgeon Critical Habitat Designation | 10 points if catchment is Atlantic sturgeon Critical Habitat |

SE Fish Habitat Conservation Mapping



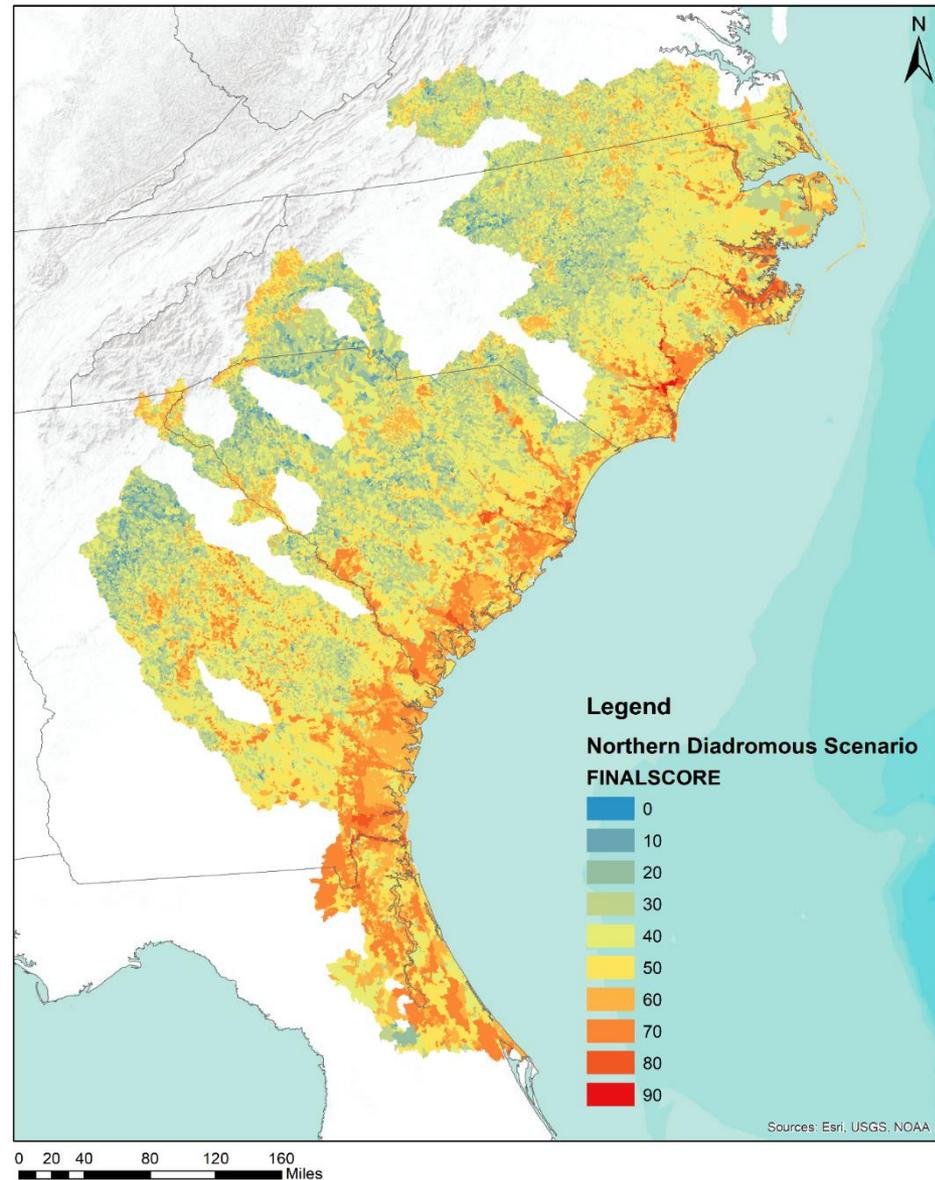
Water Usage



SE Fish Habitat Conservation Mapping



Diadromous Assessment



SE Fish Habitat Conservation Mapping



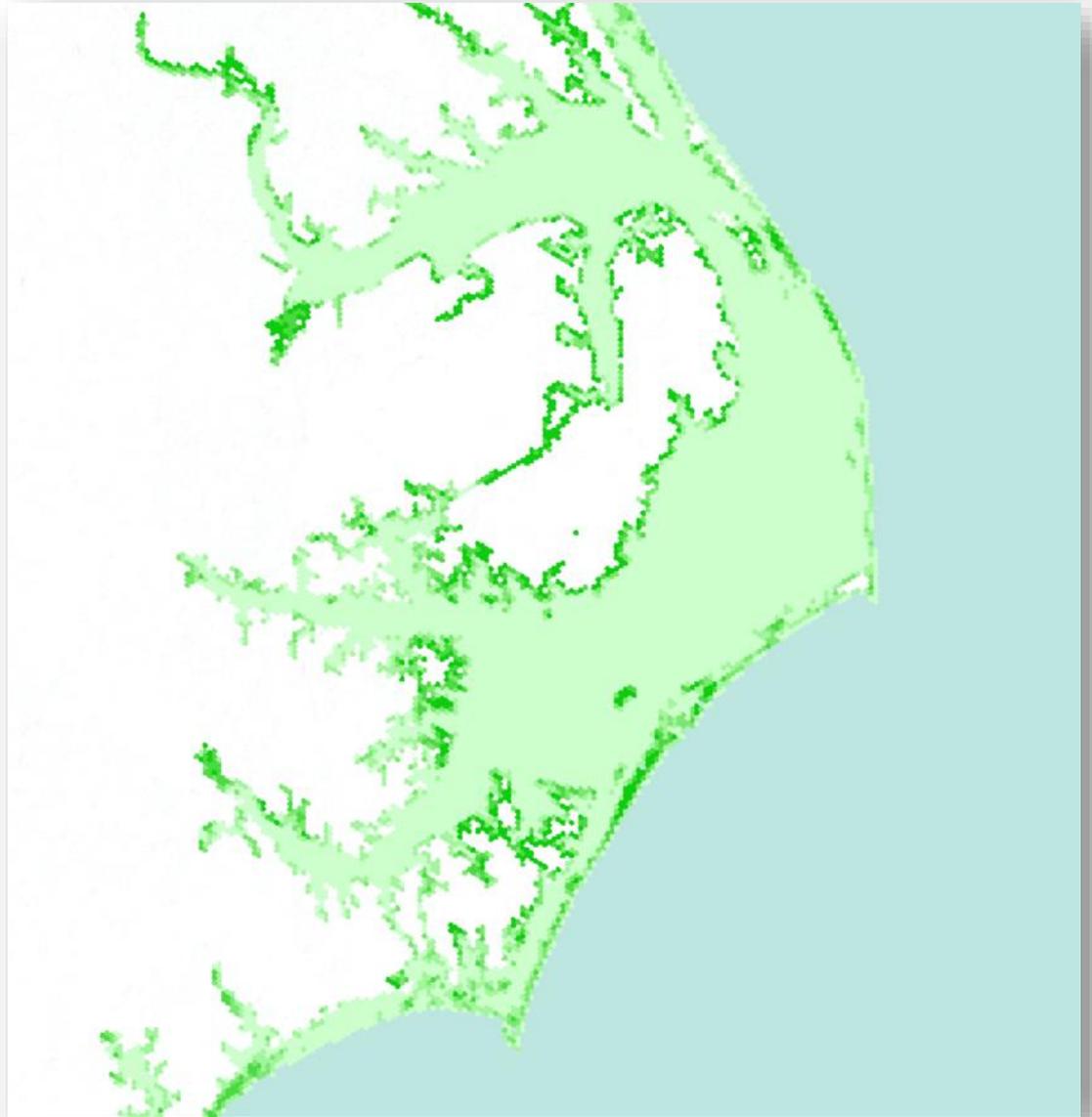
Estuarine Assessment

| 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 1/2 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/inlet |
| 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 (causeway defined as having marsh on at least 1 side) within a polygon | 10 points if the polygon has 0 ft. of causeways |

SE Fish Habitat Conservation Mapping



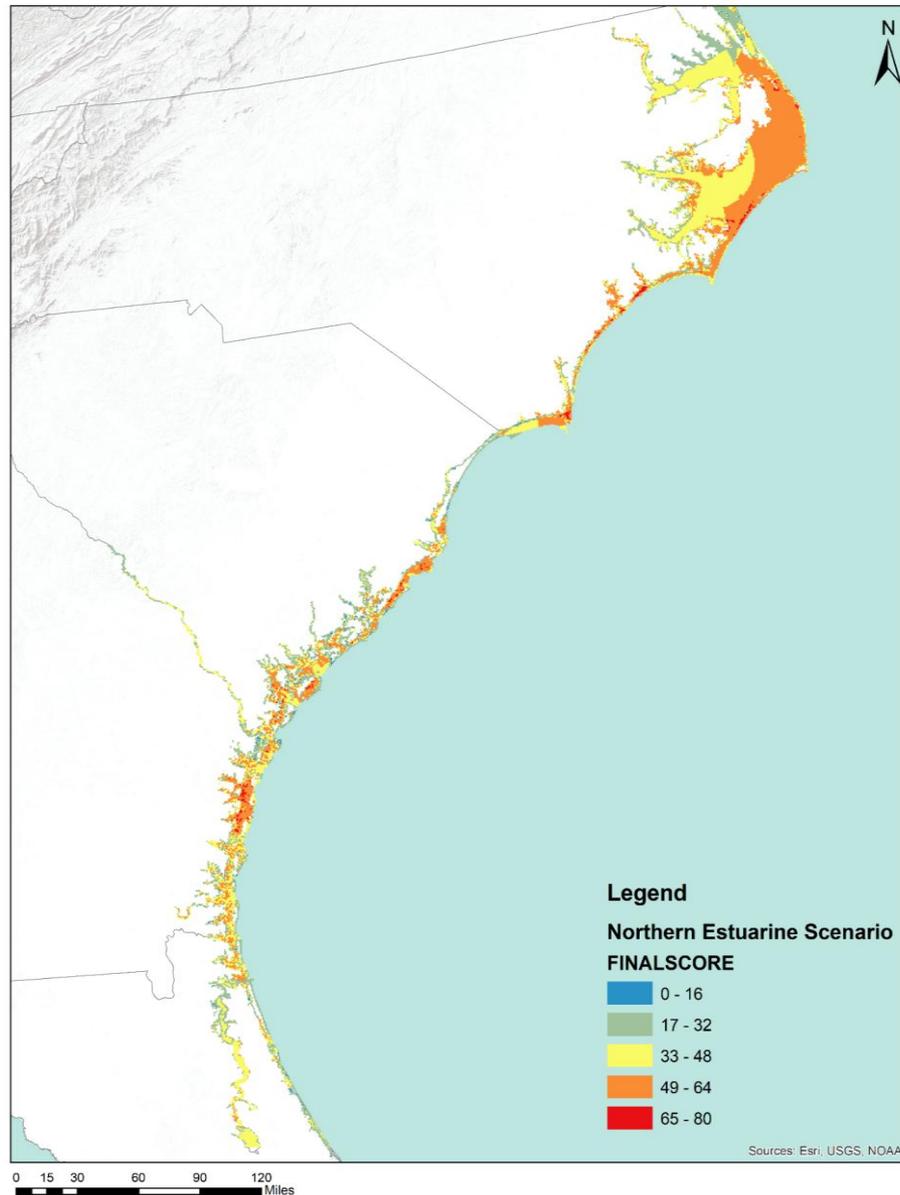
Wetlands



SE Fish Habitat Conservation Mapping



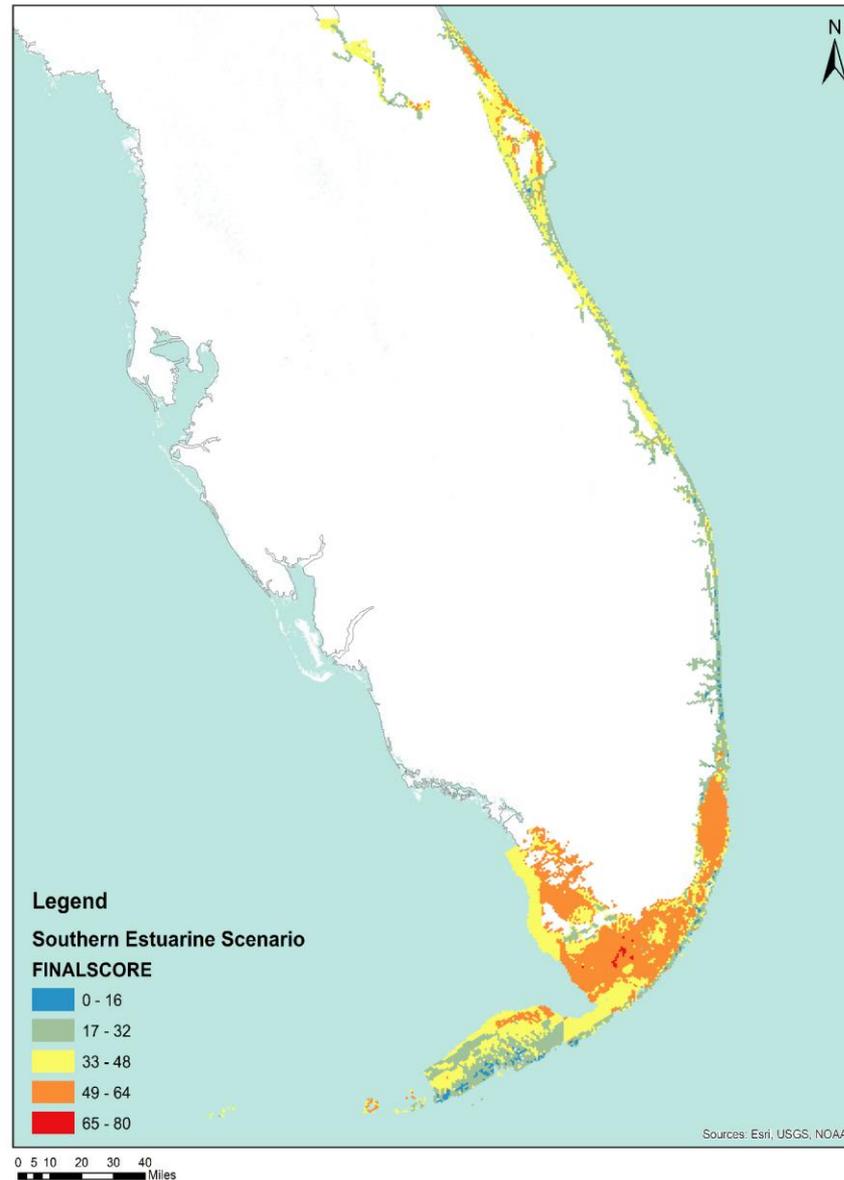
Northern Estuarine Assessment



SE Fish Habitat Conservation Mapping



Southern Estuarine Assessment





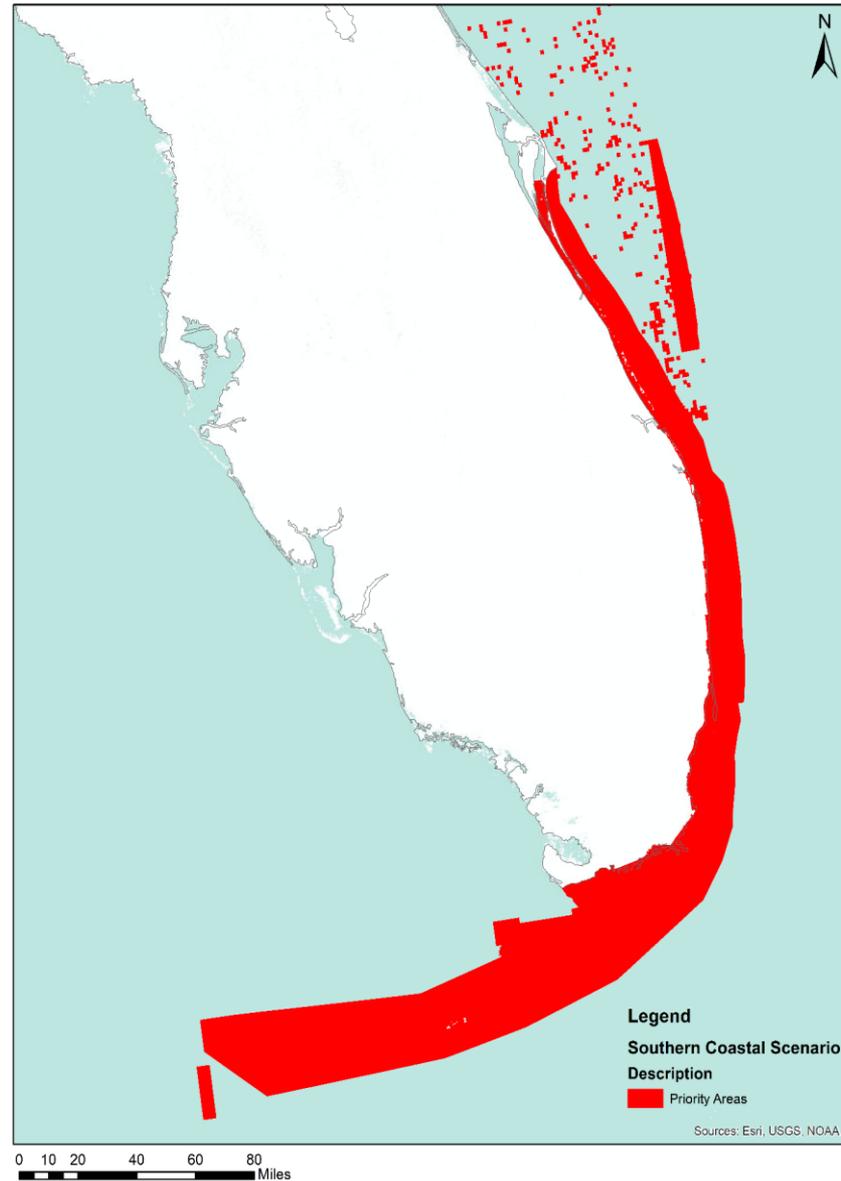
Coastal Assessment

- 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

SE Fish Habitat Conservation Mapping



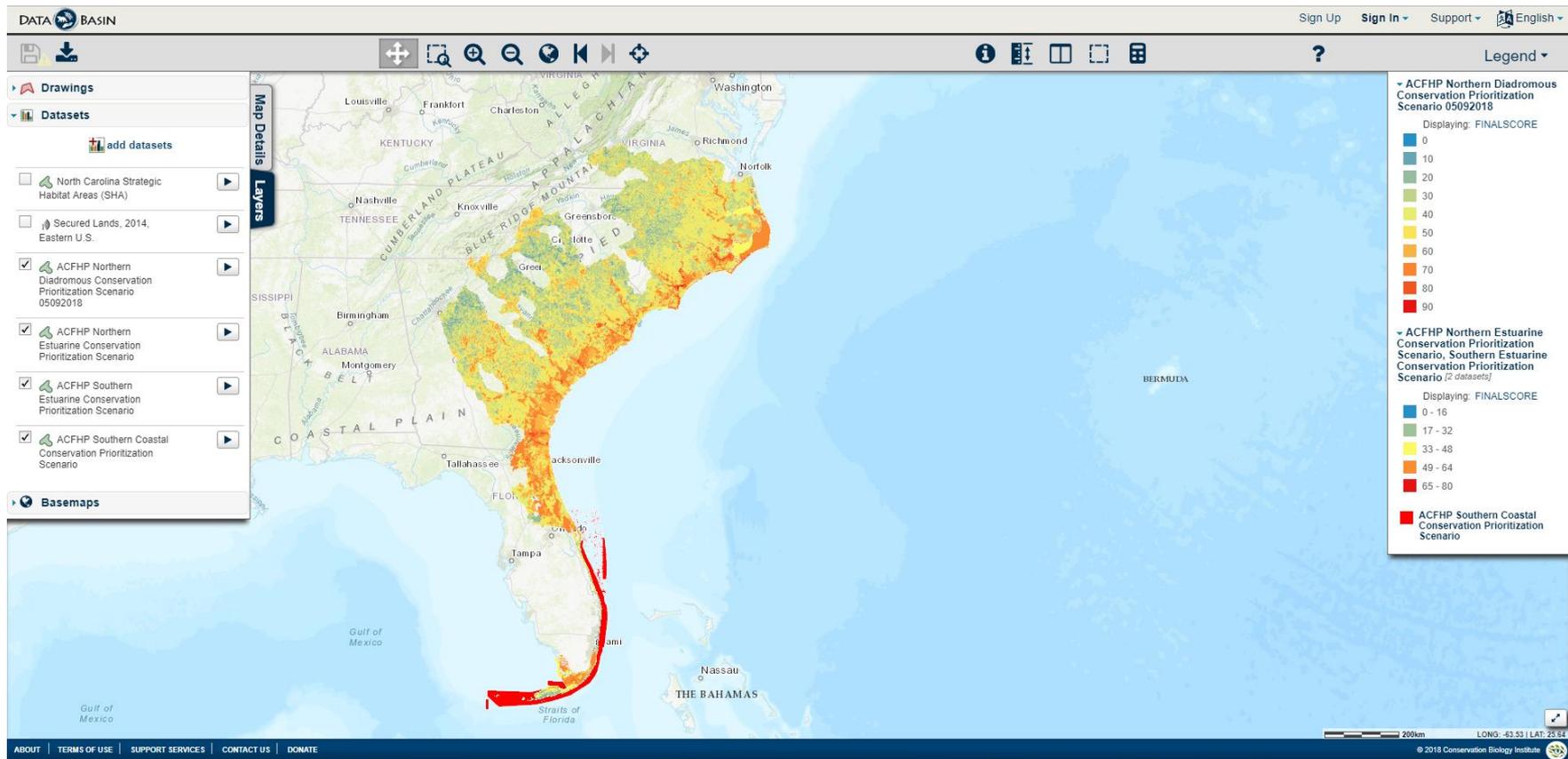
Coastal Assessment



SE Fish Habitat Conservation Mapping



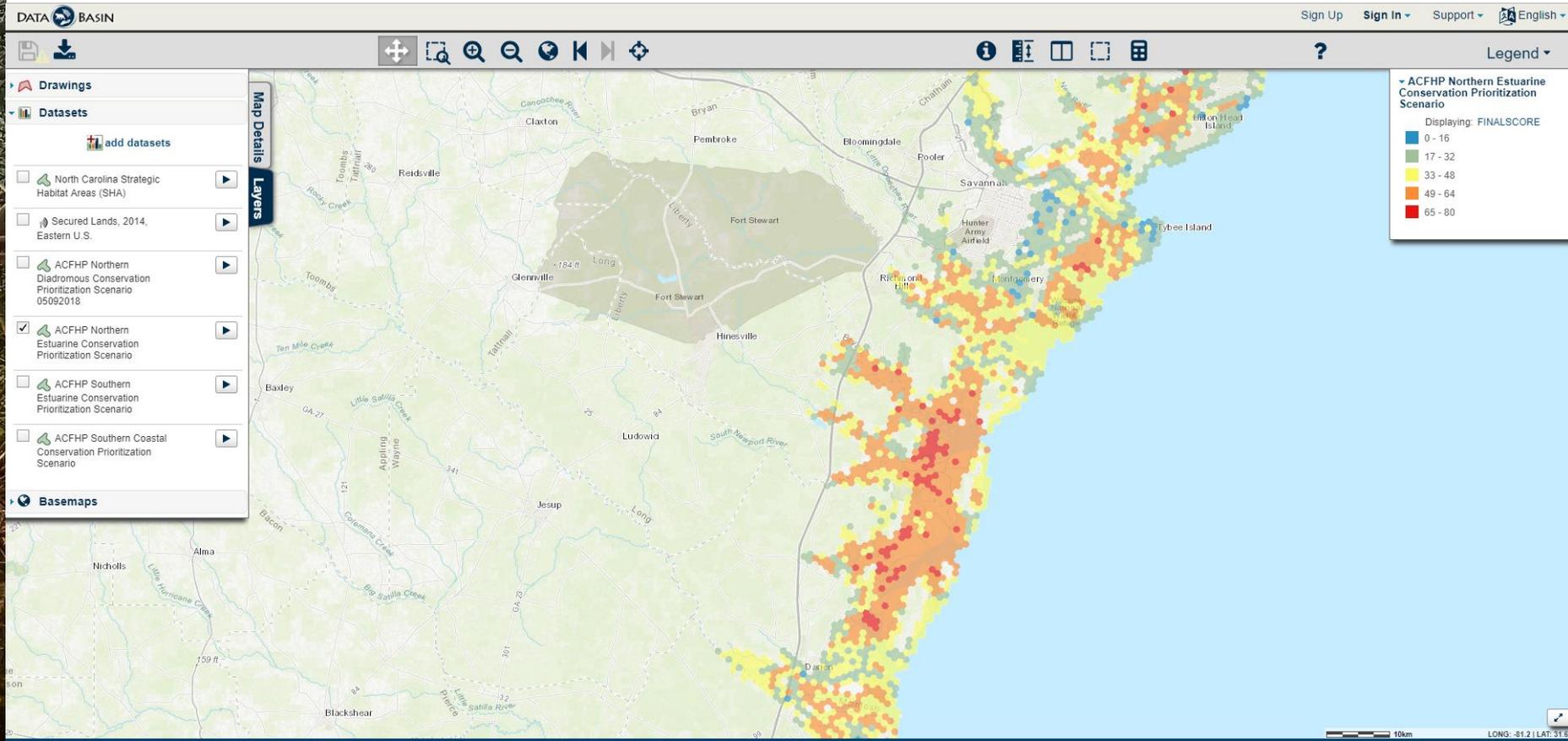
Databasin



SE Fish Habitat Conservation Mapping



Databasin



SE Fish Habitat Conservation Mapping



Databasin

DATA BASIN Search by keyword or location

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DATA BASIN | DATASETS | ACFHP NORTHERN ESTUARINE CONSERVATION PRIORITIZATION SCENARIO

ACFHP Northern Estuarine Conservation Prioritization Scenario

Uploaded by Kat Hoenke Jul 18, 2018 (Last modified Oct 3, 2018)

Download... Open in Map

Description:
ACFHP Northern Estuarine Protection Prioritization Scenario. Metrics include seagrass, oyster, wetland, 303D, causeways, and development

Details | Data Layers (1)

Data Provided By:
Kat Hoenke, Jessica Graham, Jen Walters, Lisa Havel

Content date: not specified

Contact Organization: not specified

Contact Person(s): not specified

Use Constraints:
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This dataset is visible to everyone

Dataset Type: Layer Package

Tags:
seagrass, protection, wetland, tidal, estuarine, assessment

Bookmarked by 1 Group
Included in 2 public maps

- Atlantic Coastal Fish Habitat Partnership Protection Prioritization Scenarios
- SERPPAS Coastal Resilience test map

About the Uploader

Kat Hoenke
Contractor with SARP
I am a contractor for SARP.

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Next steps

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

Goal

- Start a conversation on identifying places for protection or restoration.
- Does not contain all metrics (e.g. fishing grounds)
- Urge caution when applying it for protection

A photograph of a mangrove forest. The foreground shows a body of water reflecting the sky and the surrounding greenery. The middle ground is filled with a dense thicket of mangrove trees, their characteristic prop roots (rhizomes) extending into the water. The background is a dense canopy of green leaves, with some sunlight filtering through. A white, rounded rectangular text box is centered in the upper half of the image, containing the word "Questions?".

Questions?