Strategic Habitat Areas within the APNEP Region

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Albemarle-Pamlico Ecosystem Symposium
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Coastal Habitat Protection Plan

- Arose out of frustration over habitat and water quality issues

- Mandated by the Fisheries Reform Act – 1997

- Goal 2 – Identify, designate, and protect strategic habitat areas

North Carolina Coastal Habitat Protection Plan

By
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[1] North Carolina Department of Environment and Natural Resources, Division of Marine Fisheries
[2] The Nature Conservancy

December 2010

What are Strategic Habitat Areas?

- Subset of the coastal ecosystem

- Best of the best

- Relatively unaltered

- Maintains biodiversity and ecological functions
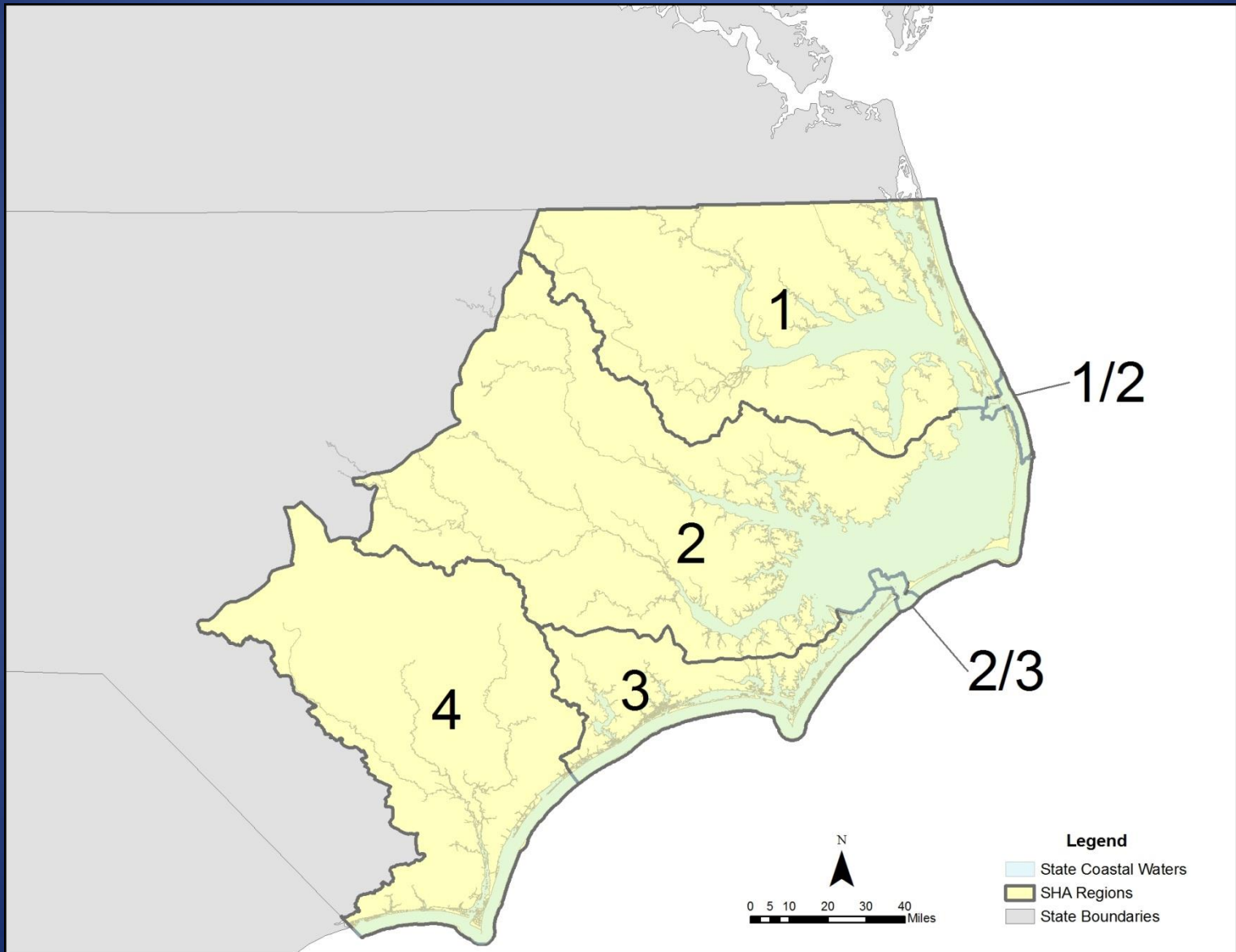
- Network of habitat connections

Strategic Habitat Areas (SHAs)

Definition:

"Specific locations of individual fish habitats or systems of fish habitats that have been identified to provide <u>exceptional habitat functions</u> or that are <u>particularly at risk</u> due to <u>imminent</u> <u>threats</u>, <u>vulnerability</u>, or <u>rarity</u>."
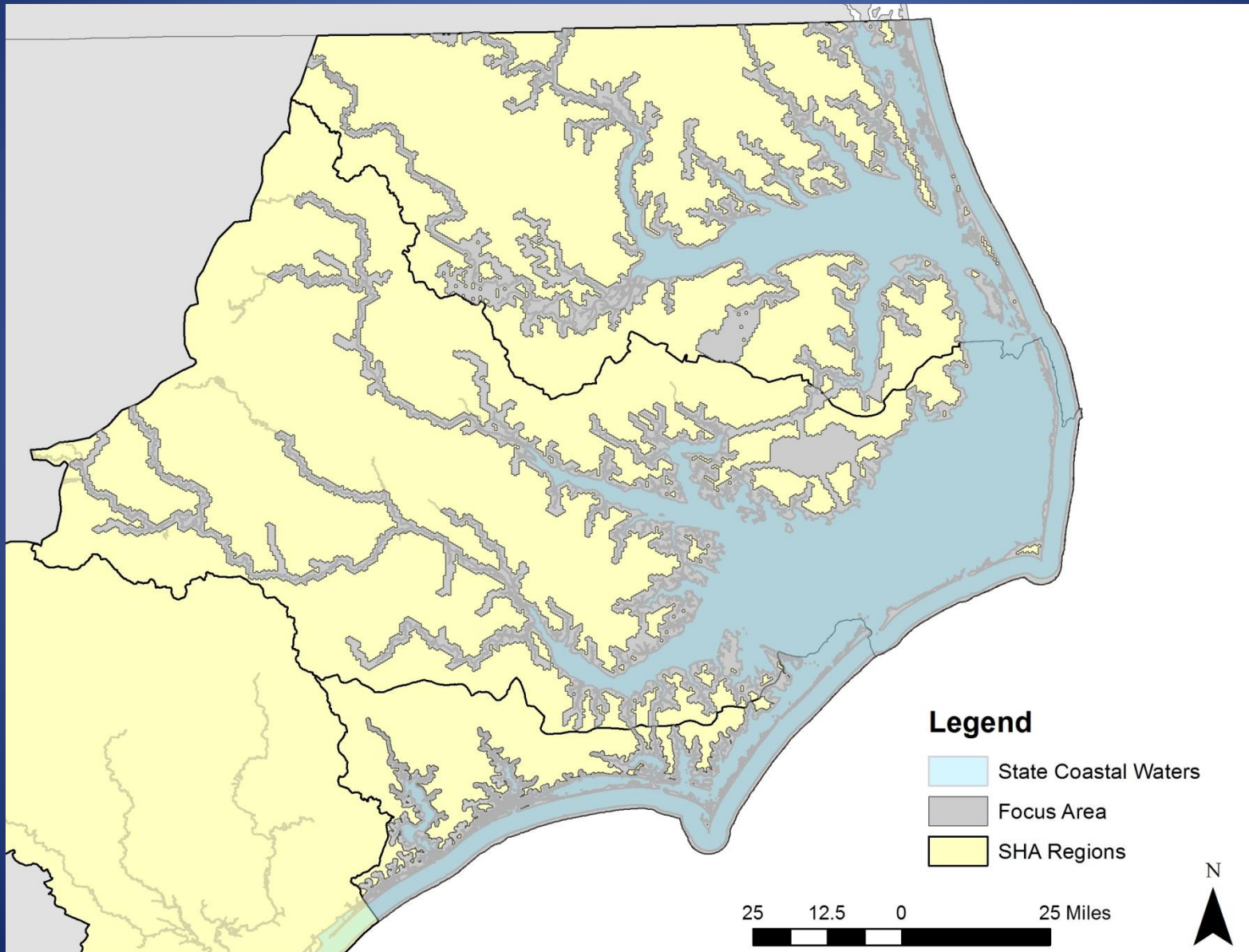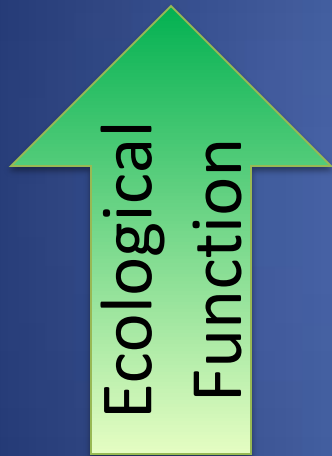
SHA Regional Boundaries

Regional Boundaries

Focus Area

Legend

State Coastal Waters

Focus Area

SHA Regions

25   12.5   0   25 Miles

N
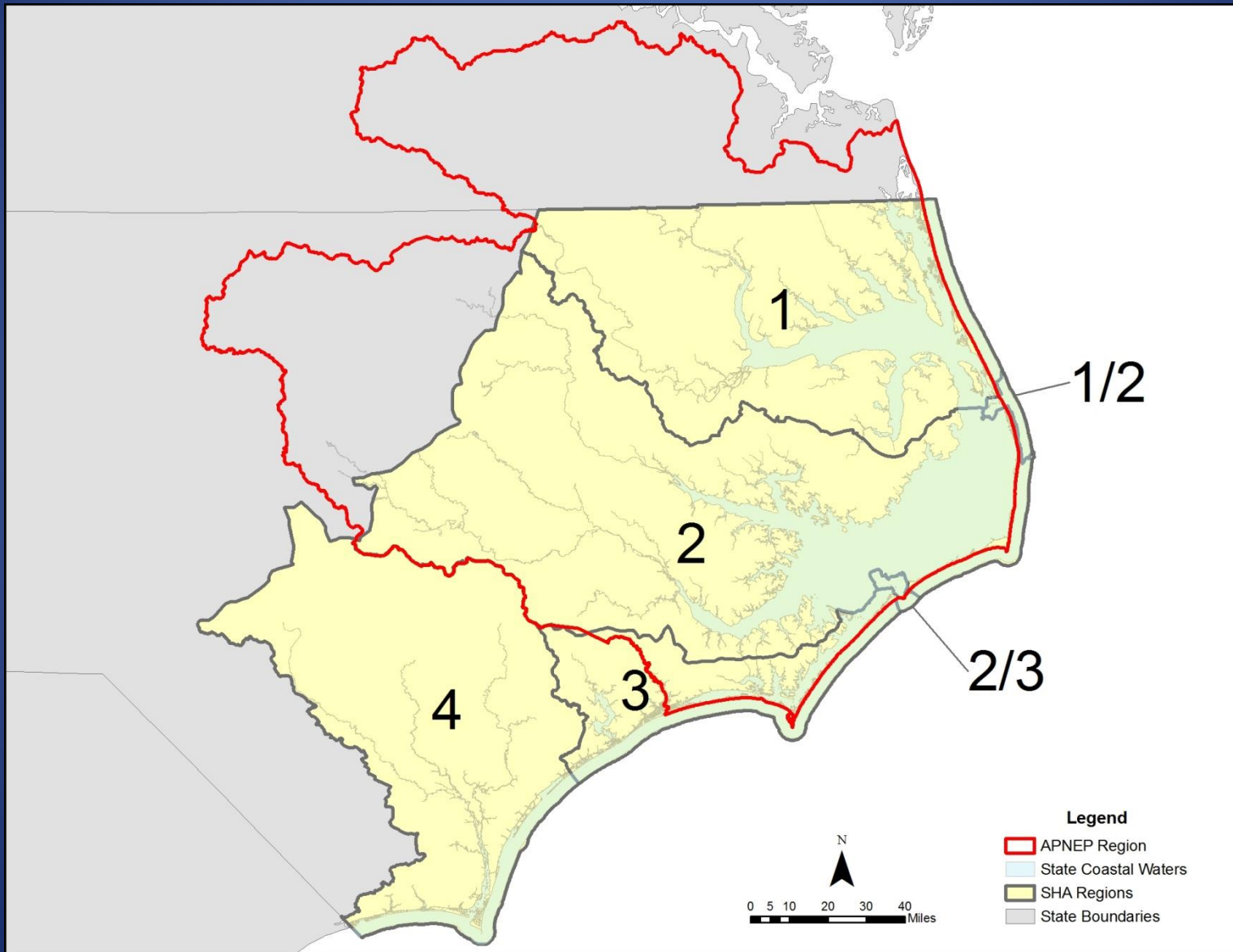
Strategic vs. Non-strategic

Alteration Level →

↑ Ecological Function

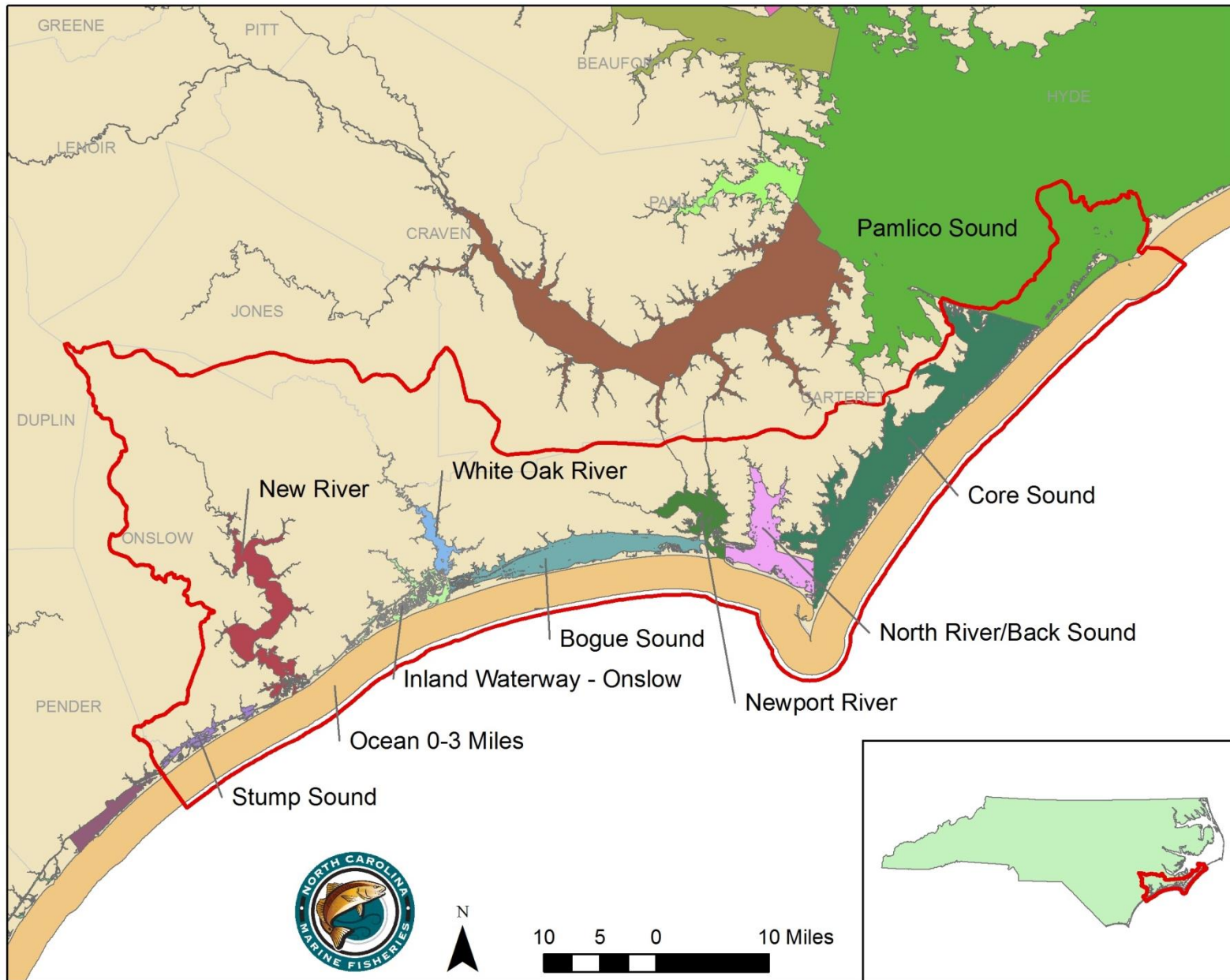|	Low	Moderate
High	**SELECTED** **Exceptional** Protect	**SELECTED** **At Risk** Restore/Enhance
Low	**NOT SELECTED** **Status Quo** Rely on existing protections	

Ecological Function = Service provided to fish or environment (e.g., spawning/nursery area)
Alteration = disturbance by human activity

How Do We Select SHAs?

- Goal is to protect and enhance coastal fisheries
  - Identify priority fisheries
  - Determine what habitats are important to those fisheries for their various life history stages (NATURAL RESOURCE TARGETS)
  - Determine how much of each habitat should be included in the SHA network

    (REPRESENTATION LEVEL)

Strategic Habitat Area Region 3

GREENE
PITT
BEAUFORT
HYDE
LENOIR
PAMLICO
CRAVEN
Pamlico Sound
JONES
CARTERET
DUPLIN
White Oak River
New River
Core Sound
ONSLOW
Bogue Sound
North River/Back Sound
Inland Waterway - Onslow
Newport River
PENDER
Ocean 0-3 Miles
Stump Sound

NORTH CAROLINA MARINE FISHERIES

N

10   5   0   10 Miles

Region 3 Priority Fisheries

- Oysters
- Hard clams
- Bay scallops
- Shrimp
- Blue crab
- Southern flounder
- Spotted seatrout
- Red drum

- Weakfish
- Spot
- Gag
- Black sea bass

Natural Resource Targets

Water column
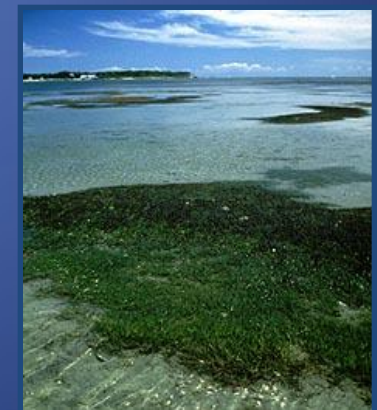
Shell bottom

Hard bottom

Wetlands

Soft bottom

Submerged Aquatic Vegetation

Target Representation Levels

Selected based on functional importance, rarity, sensitivity, vulnerability, and/or historical losses of habitat.
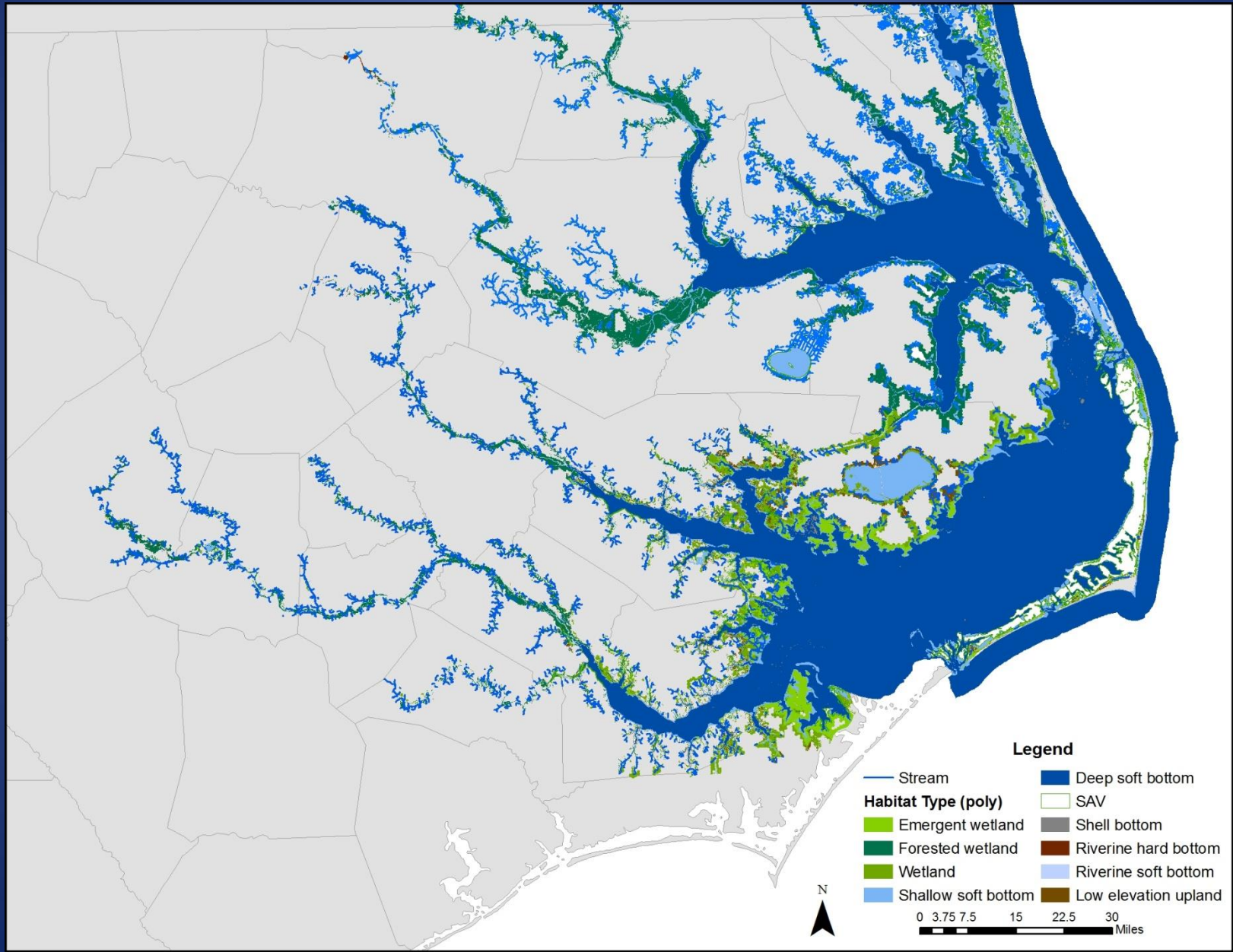
High representation (100-60%)
- Riverine hard bottom
- High salinity SAV
- Low salinity SAV
- Intertidal & subtidal shell bottom
- Ocean hard bottom

Moderate rep. (20-15%)
- Freshwater forested wetlands (wet, mostly wet)
- Freshwater marsh (wet, mostly wet)
- Wetland edge
- Salt/brackish marsh
- Intertidal & subtidal shell bottom (low density)
- Freshwater, estuarine, and marine soft bottom (0-3 ft)
- Intertidal soft bottom
- Low elevation streams

Natural Resource Targets

Legend

Stream — Deep soft bottom

Habitat Type (poly)
- Emergent wetland — SAV
- Forested wetland — Shell bottom
- Wetland — Riverine hard bottom
- Shallow soft bottom — Riverine soft bottom
- Low elevation upland

0 3.75 7.5 15 22.5 30 Miles

Region 3 Alteration Factors

- Human activities that impact the coastal environment:
  - Hydrological
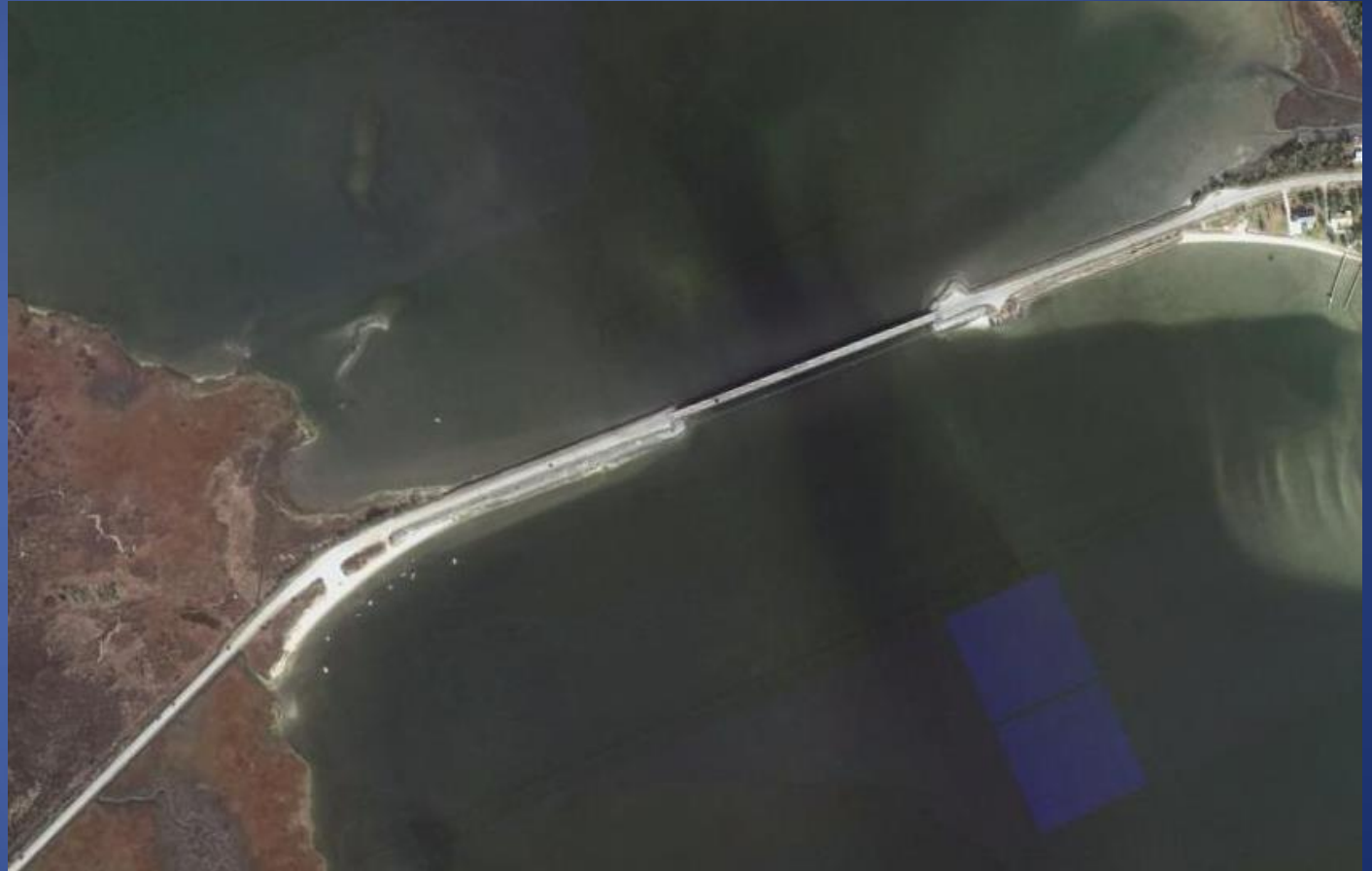 - Water Quality
  - Physical

Hydrological Alterations

Culverts

Hydrological Alterations

Bridge Restrictions
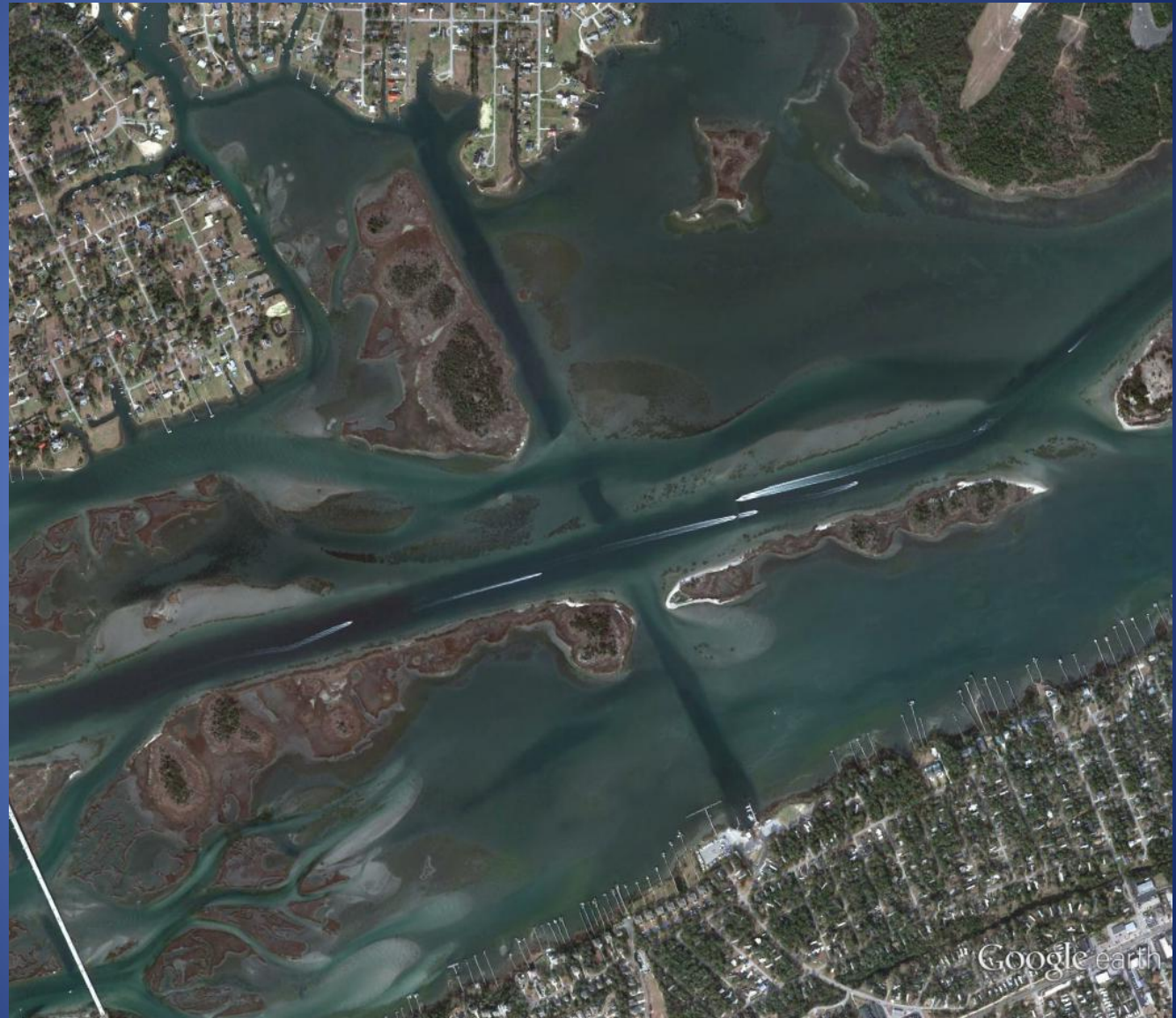
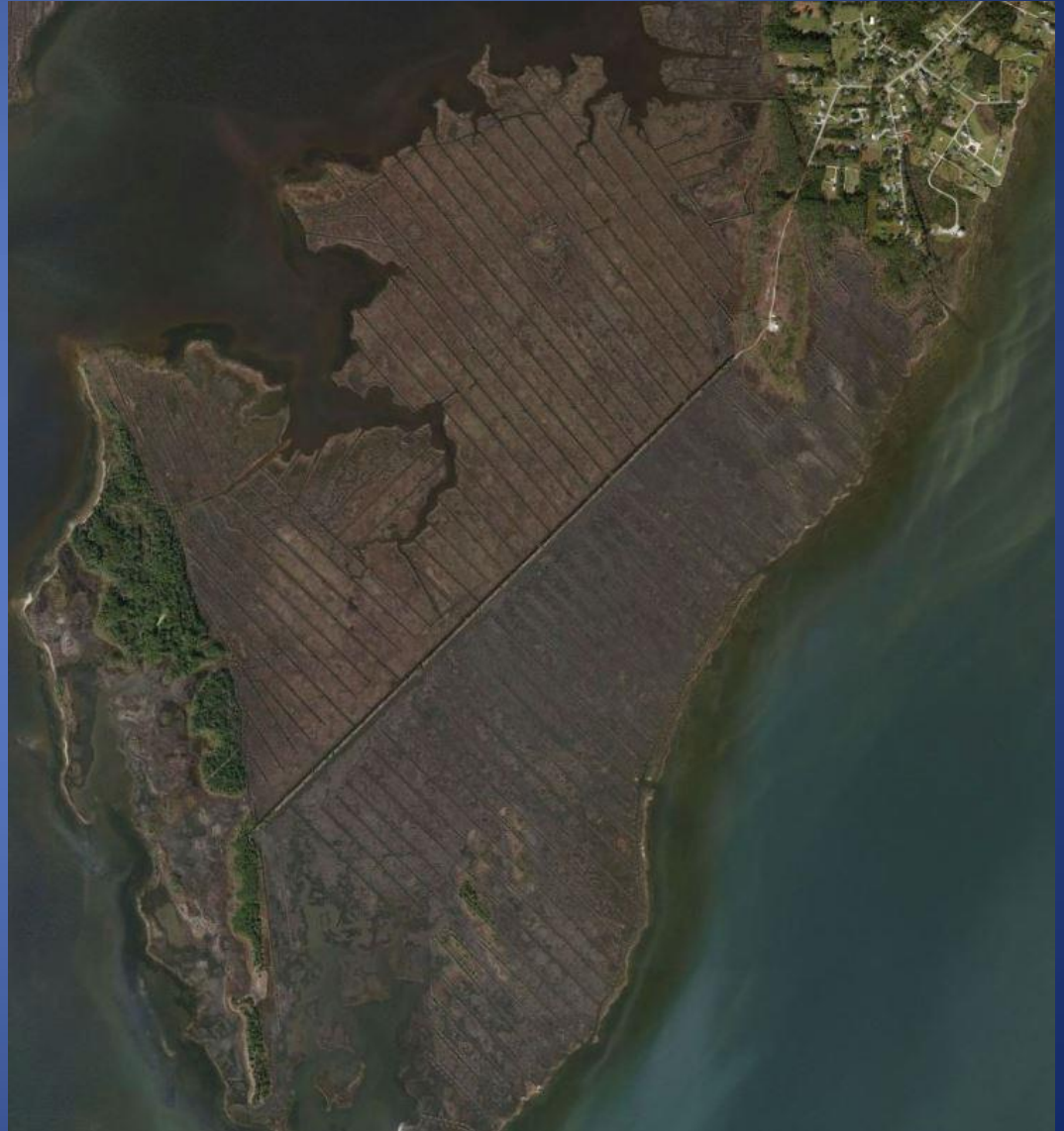# Hydrological Alterations

Impoundments

Hydrological Alterations

Bulkheads

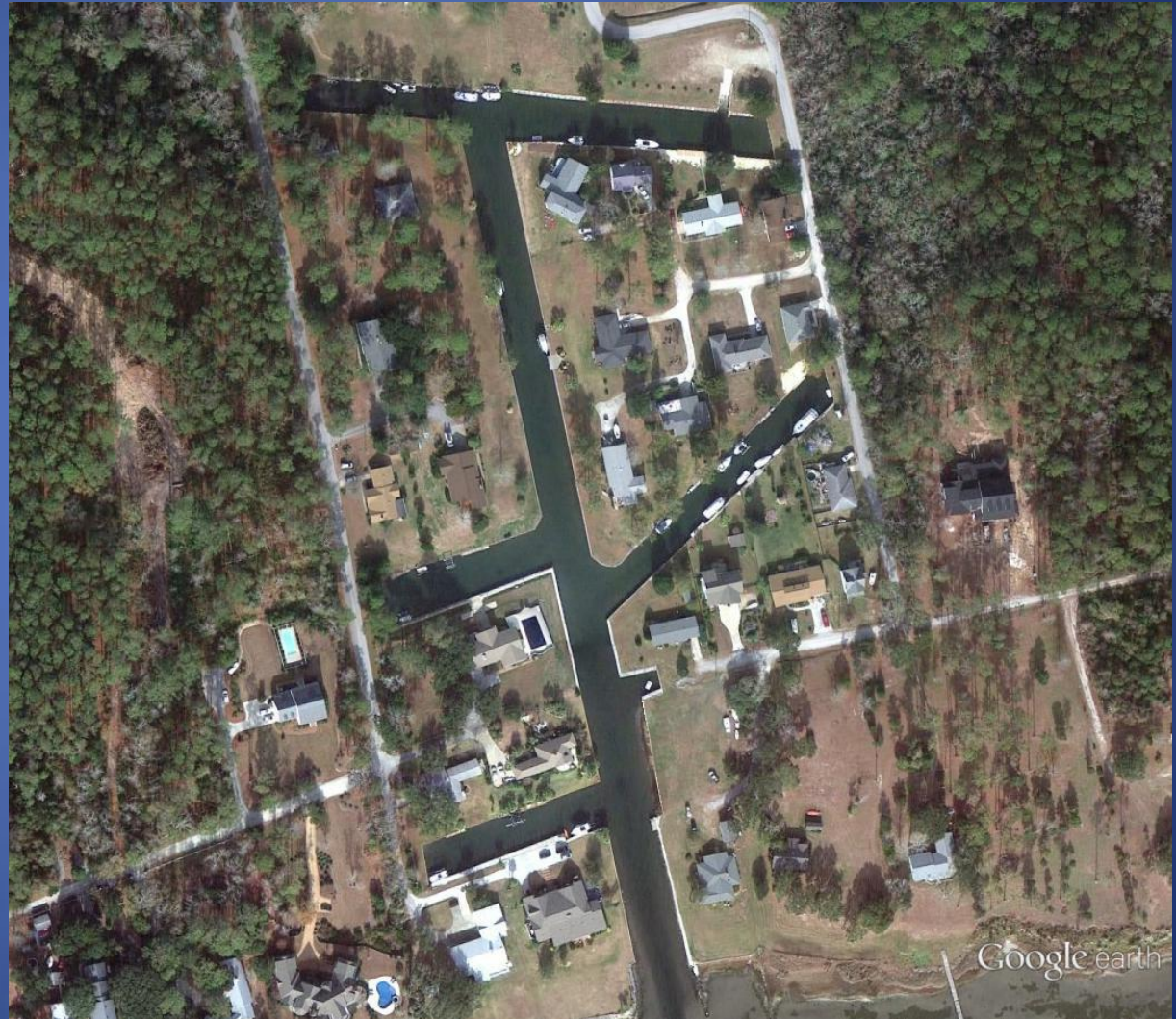# Hydrological Alterations

Dredged

Channels

Hydrological Alterations

Ditched/Drained

Hydrological Alterations

Canals & Boat Basins

Water Quality Alterations

Major &
Minor
NPDES

Water Quality Alterations

Marinas

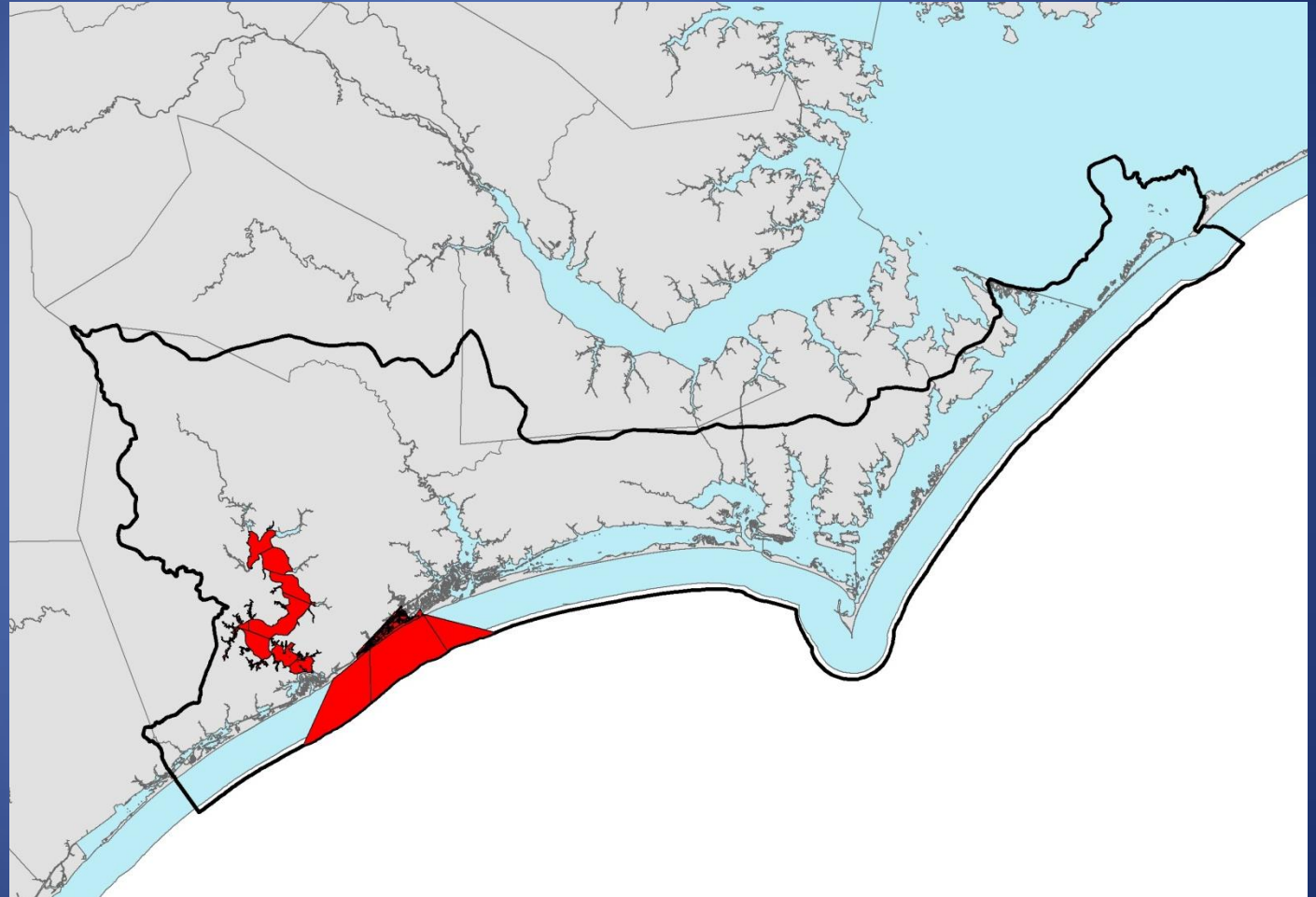# Water Quality Alterations

Animal Operations

Water Quality Alterations

Mining
Discharge

Water Quality Alterations

Military Restricted Areas

Water Quality Alterations

Developed Land Use

Water Quality Alterations

Agricultural
Land Use

Water Quality Alterations

Prohibited Shellfish Harvest Areas

Physical Alterations

Trawling & Dredging

Physical Alterations

Mechanical Clam
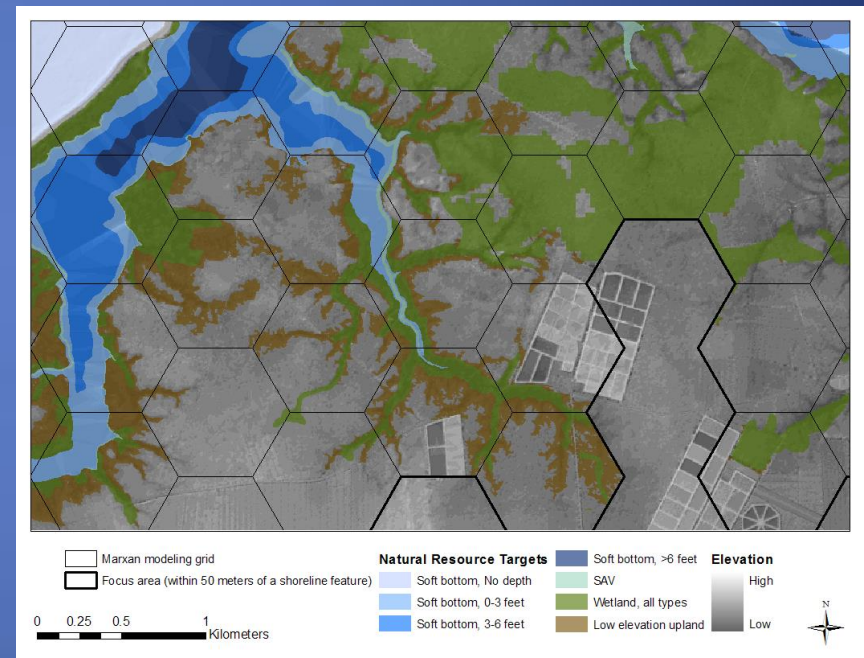Harvest Areas

Alteration Scores

Legend

SHA Regions
State Waters
Counties
State Boundaries

Alteration Score
- < -0.50 Std. Dev.
- -0.50 - 0.50 Std. Dev.
- 0.50 - 1.5 Std. Dev.
- > 1.5 Std. Dev.

N
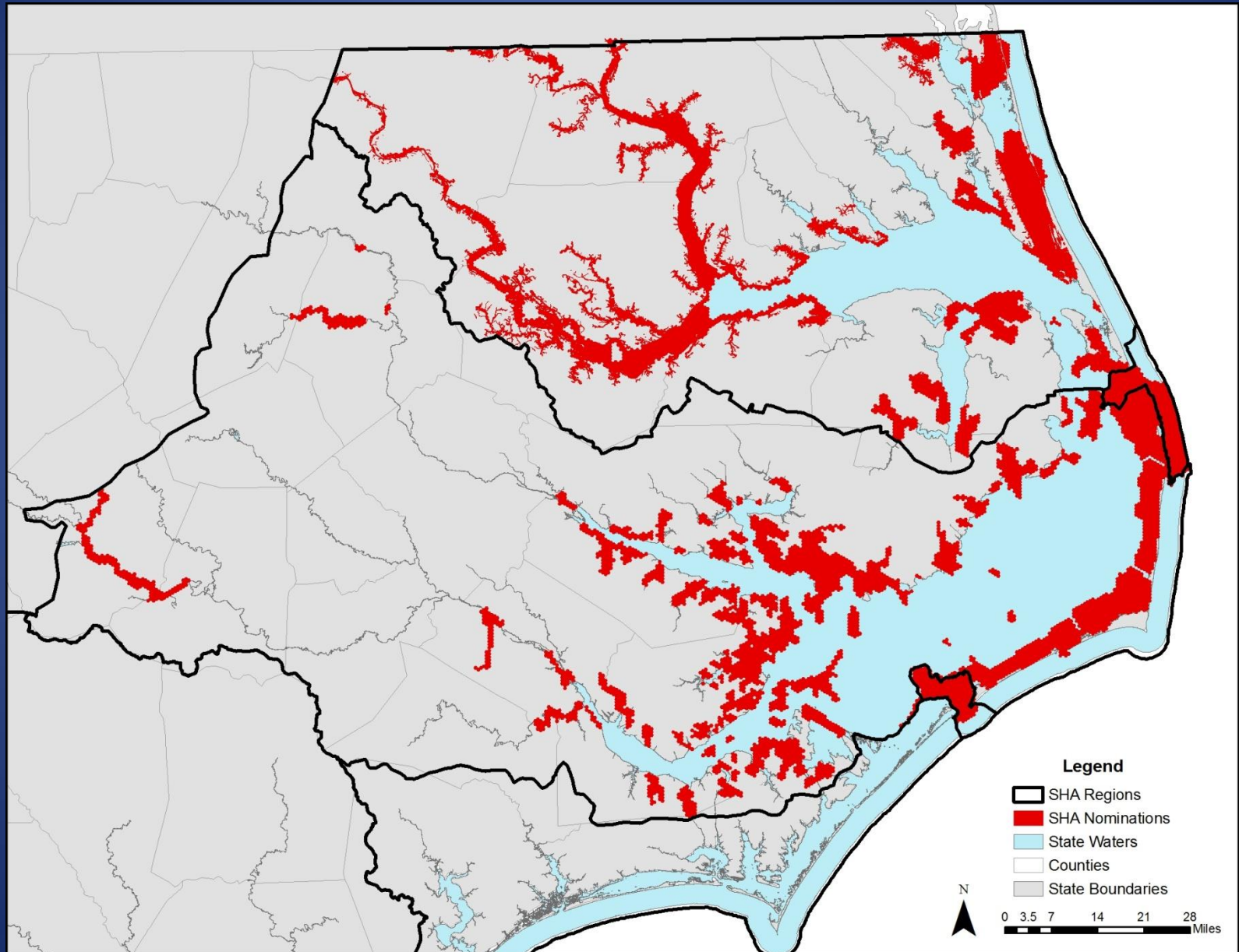
0 3.75 7.5 15 22.5 30
Miles
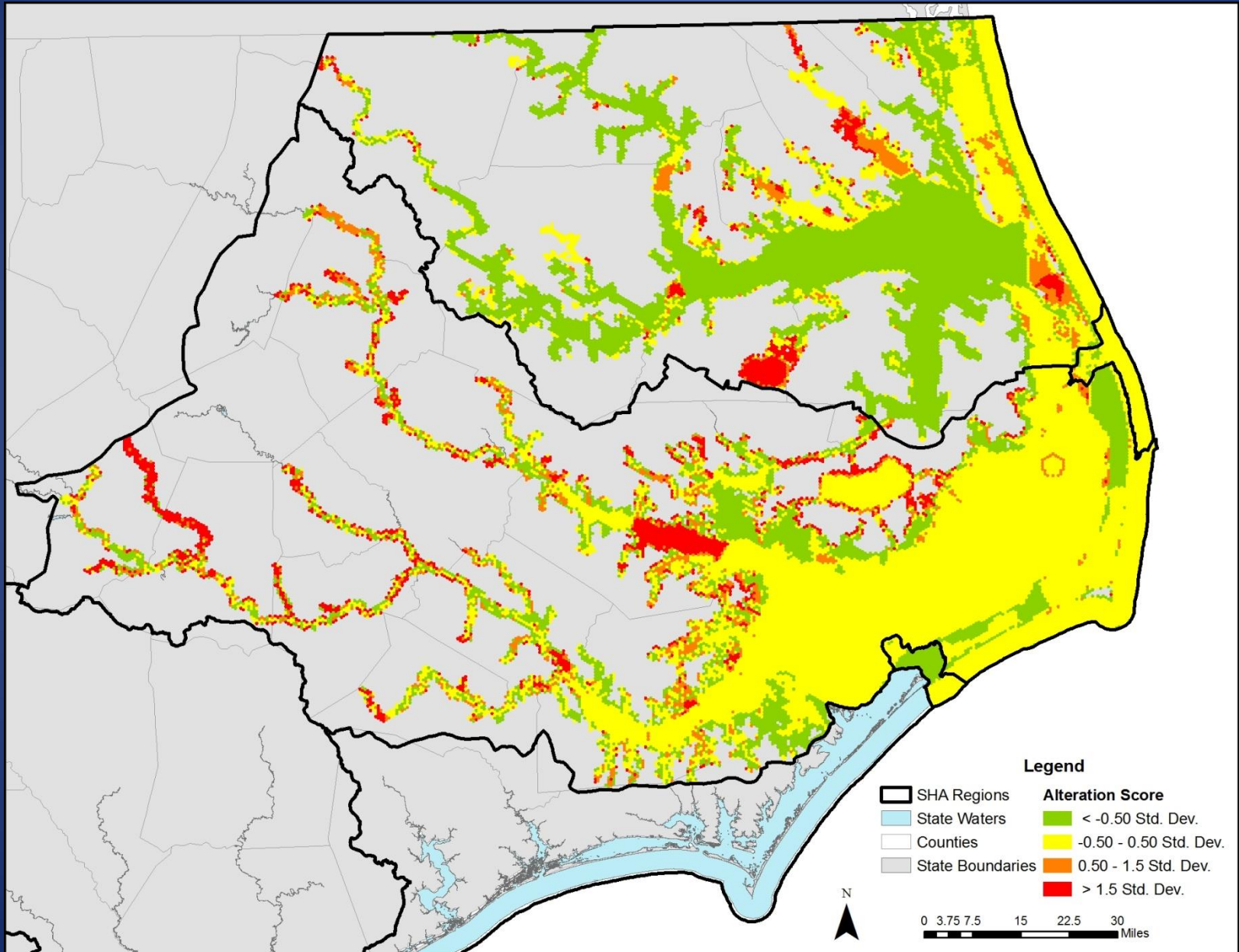
Computer Software - MARXAN

- TARGETS = Habitats

- ALTERATIONS = Known threats/degradation

- Data put into computer maps (GIS)

- Hexagon grid overlay

- MARXAN (site selection software) run to get draft results

Marxan modeling grid
Focus area (within 50 meters of a shoreline feature)

Natural Resource Targets
Soft bottom, No depth
Soft bottom, 0-3 feet
Soft bottom, 3-6 feet
Soft bottom, >6 feet
SAV
Wetland, all types
Low elevation upland

Elevation
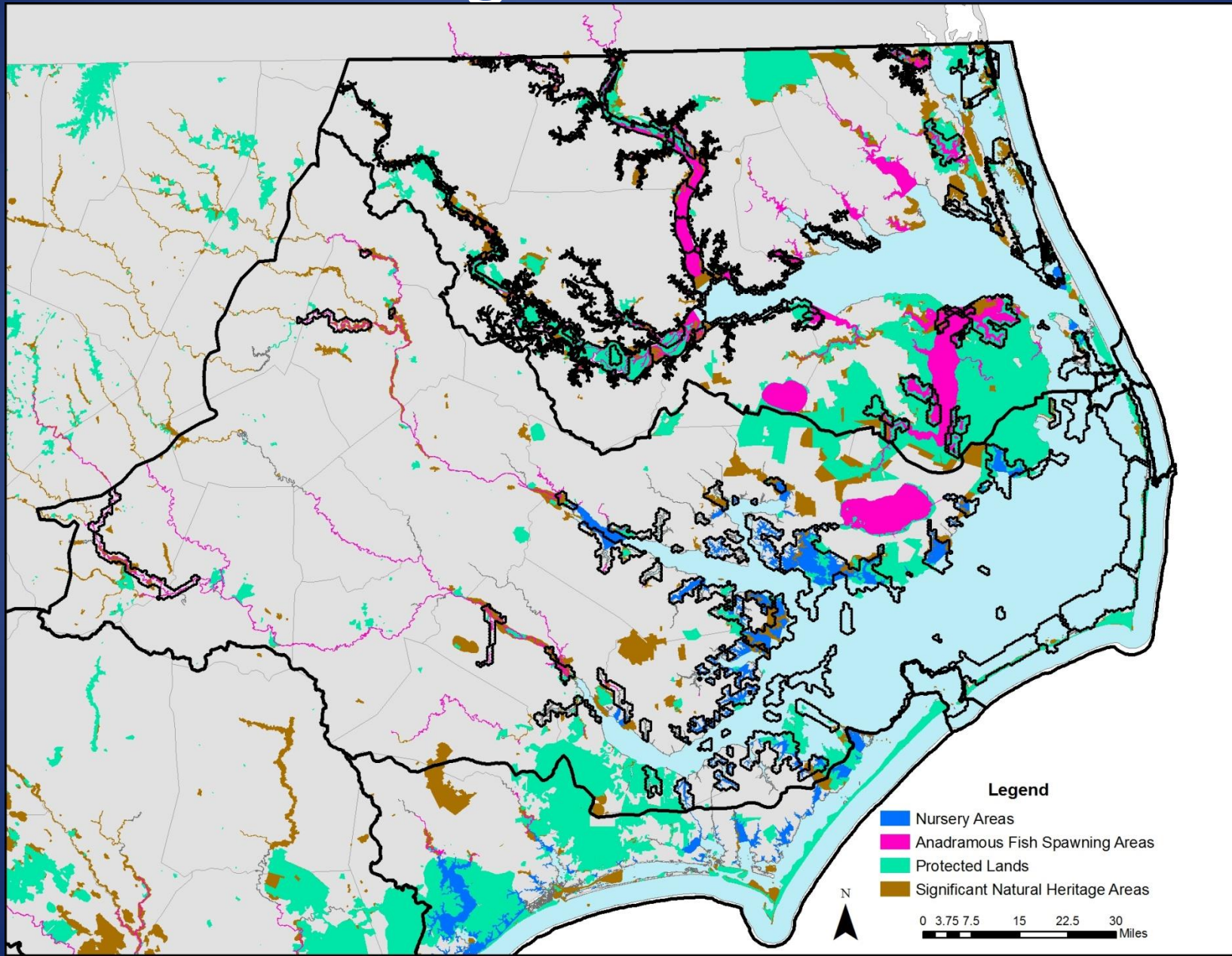High
Low

0   0.25   0.5   1 Kilometers

Criteria for Expert Modification

- Habitats present – rare, vulnerable, diverse
- Occurrence of ecological designations
- Alteration factors and ratings
- Selection frequency
- Fish data/information available
- Water quality impairment status
- Size/isolation/connectivity/shape
- Regional importance of a functional area

SHA Nominations

Legend
- SHA Regions
- SHA Nominations
- State Waters
- Counties
- State Boundaries

N

0 3.5 7   14   21   28
Miles

Designated Areas

Legend
- Nursery Areas
- Anadramous Fish Spawning Areas
- Protected Lands
- Significant Natural Heritage Areas

N

0 3.75 7.5   15   22.5   30
Miles

ATLANTIC OCEAN

Oregon Inlet

STUMPY POINT BAY

PAMLICO SOUND
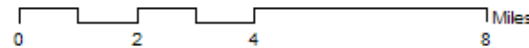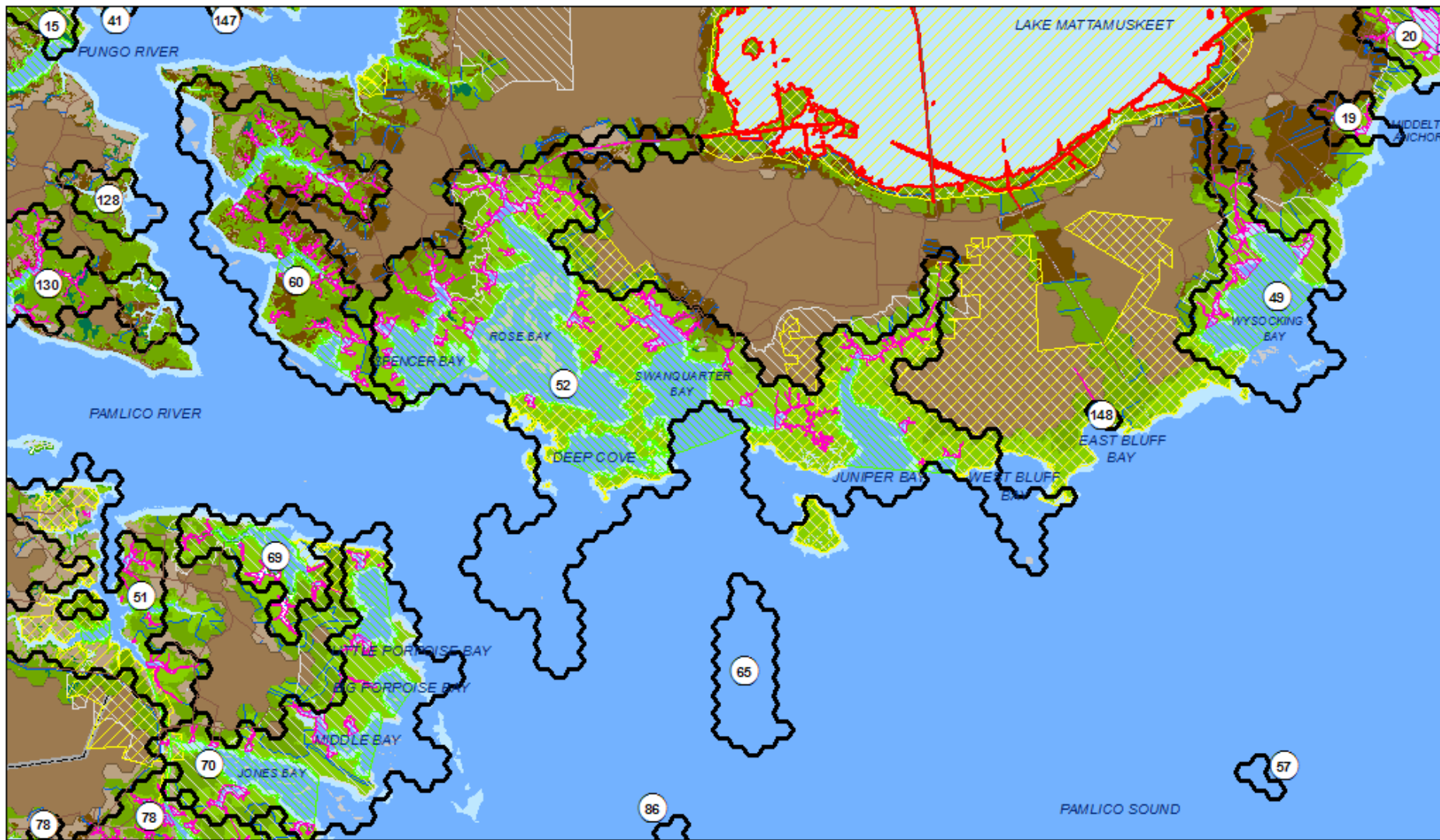
PARCHED CORN BAY

150

7

123

38

14

145

Legend

- ○ Cities
- 〜 Roads
- 〜 Stream
- ▭ SHA nominations
- ▭ County Boundaries
- ▭ Focus area
- 〜 AFSA shorelines
- ▨ Primary Nursery Area
- ▨ Secondary Nursery Area
- ▨ Conservation lands
- ▨ Significant natural heritage areas
- ⌐⌐ Crab Spawning Sanctuaries

Habitat type
- Emergent wetland
- Forested wetland
- Wetland
- Shallow soft bottom
- Deep soft bottom
- ▨ SAV
- Shell bottom
- Riverine hard bottom
- Riverine soft bottom
- Low elevation upland

0   2   4   8   Miles

N

Map Labels

PUNGO RIVER

LAKE MATTAMUSKEET

MIDDLETOWN ANCHOR

WYSOCKING BAY

ROSE BAY

SPENCER BAY

SWANQUARTER BAY

DEEP COVE

JUNIPER BAY

WEST BLUFF BAY

EAST BLUFF BAY

PAMLICO RIVER

LITTLE PORPOISE BAY

BIG PORPOISE BAY

MIDDLE BAY

JONES BAY

PAMLICO SOUND

Legend

- ○ Cities
- ∿ Roads
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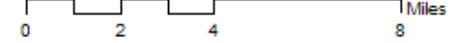- ▨ Crab Spawning Sanctuaries

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Miles
0 2 4 8

N

Potential Non-regulatory Actions

- **Site specific based on area function, and type/severity of alteration**

- Incorporate SHAs into land acquisition for conservation planning by environmental groups and federal, state, and local agencies

- Pursue restoration projects that would benefit SHAs

- Pursue funding for agriculture cost share programs to implement Best Management Practices near SHAs

- Use SHAs in local land use planning and permit reviews

- Prioritize funding for enhancement and restoration of fish passage, hydrology, and habitats

- Initiate monitoring of APNEP indicators within SHAs to assess trends

Next Steps

- No regulatory management measures proposed
- Ground truth sites
- Complete SHA analysis in regions 3&4

Questions?