Ecoregional Assessments and Marine Mapping Activities

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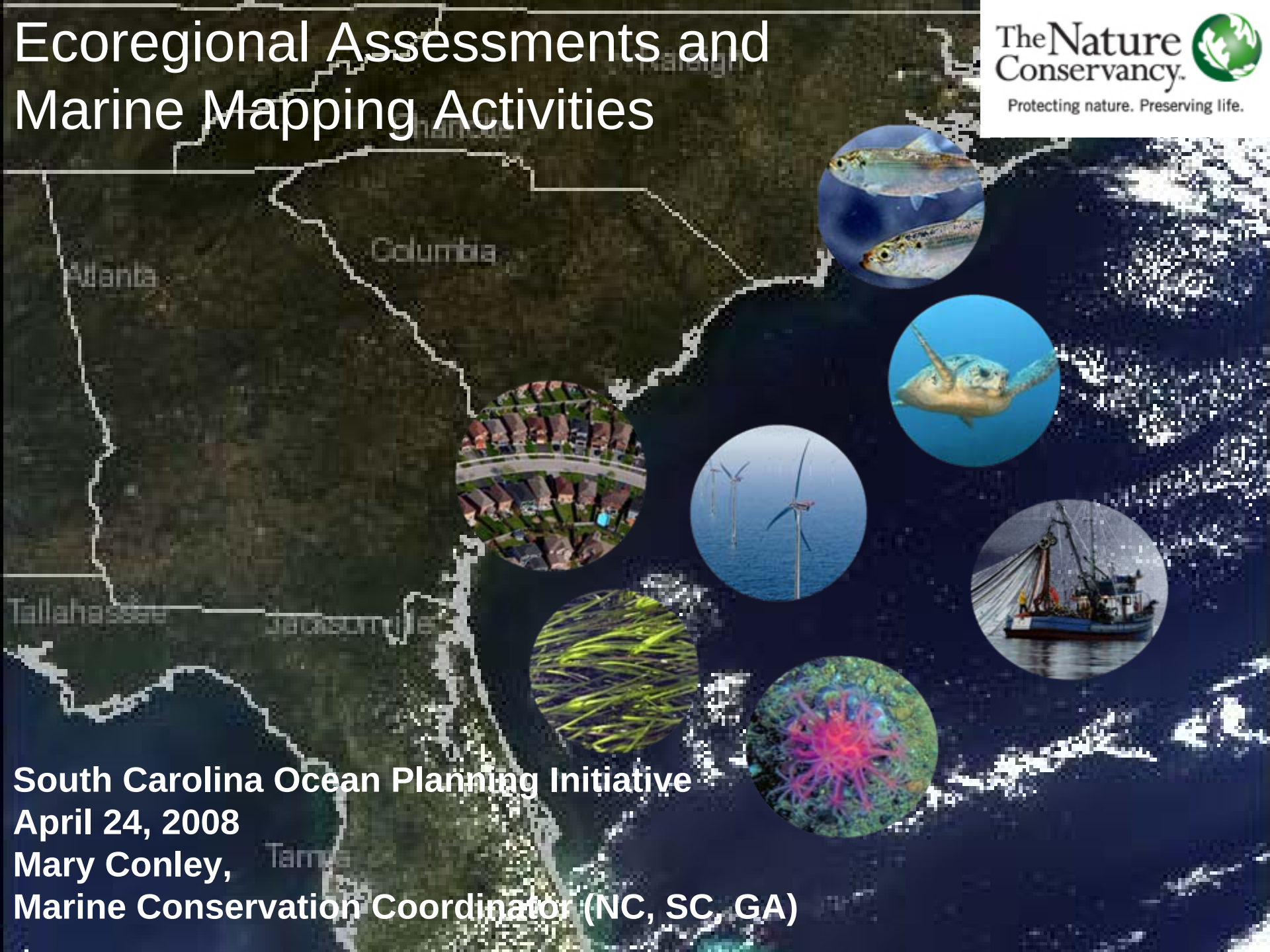


South Carolina Ocean Planning Initiative
April 24, 2008
Mary Conley,
Marine Conservation Coordinator (NC, SC, GA)

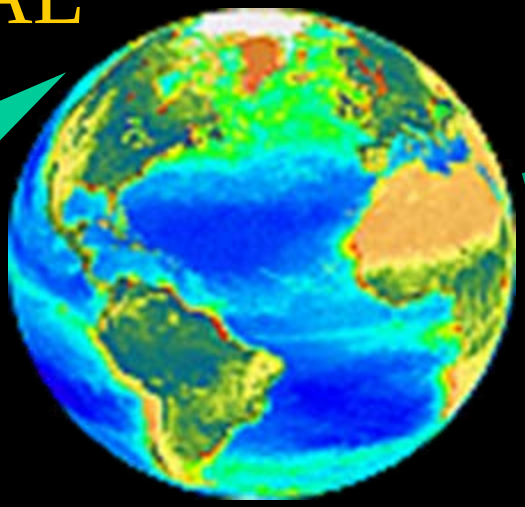
Presentation Outline

- The Nature Conservancy and Marine Conservation
- Carolinian Ecoregional Assessment
- Northwest Atlantic Marine Ecoregional Assessment
- Utilization of Ecoregional Assessment - Ecosystem-Based Management

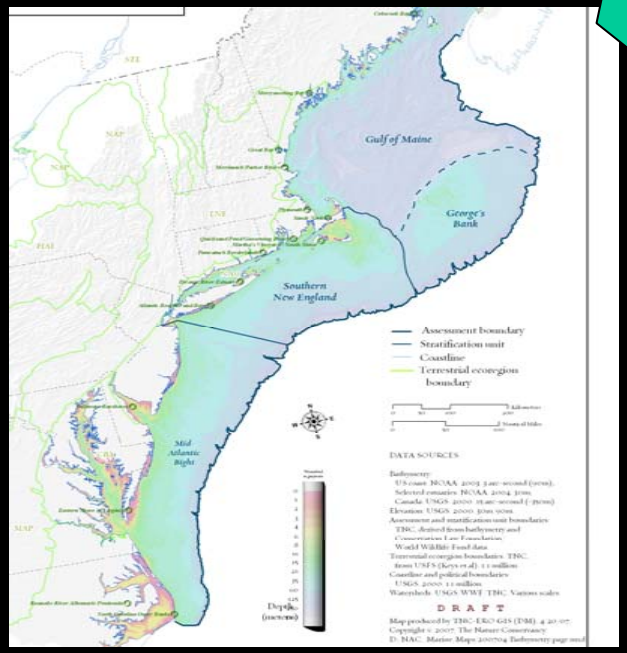
Why is TNC involved in marine conservation?

The mission of The Nature Conservancy is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive

GLOBAL



REGIONAL



LOCAL

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Conservation by Design

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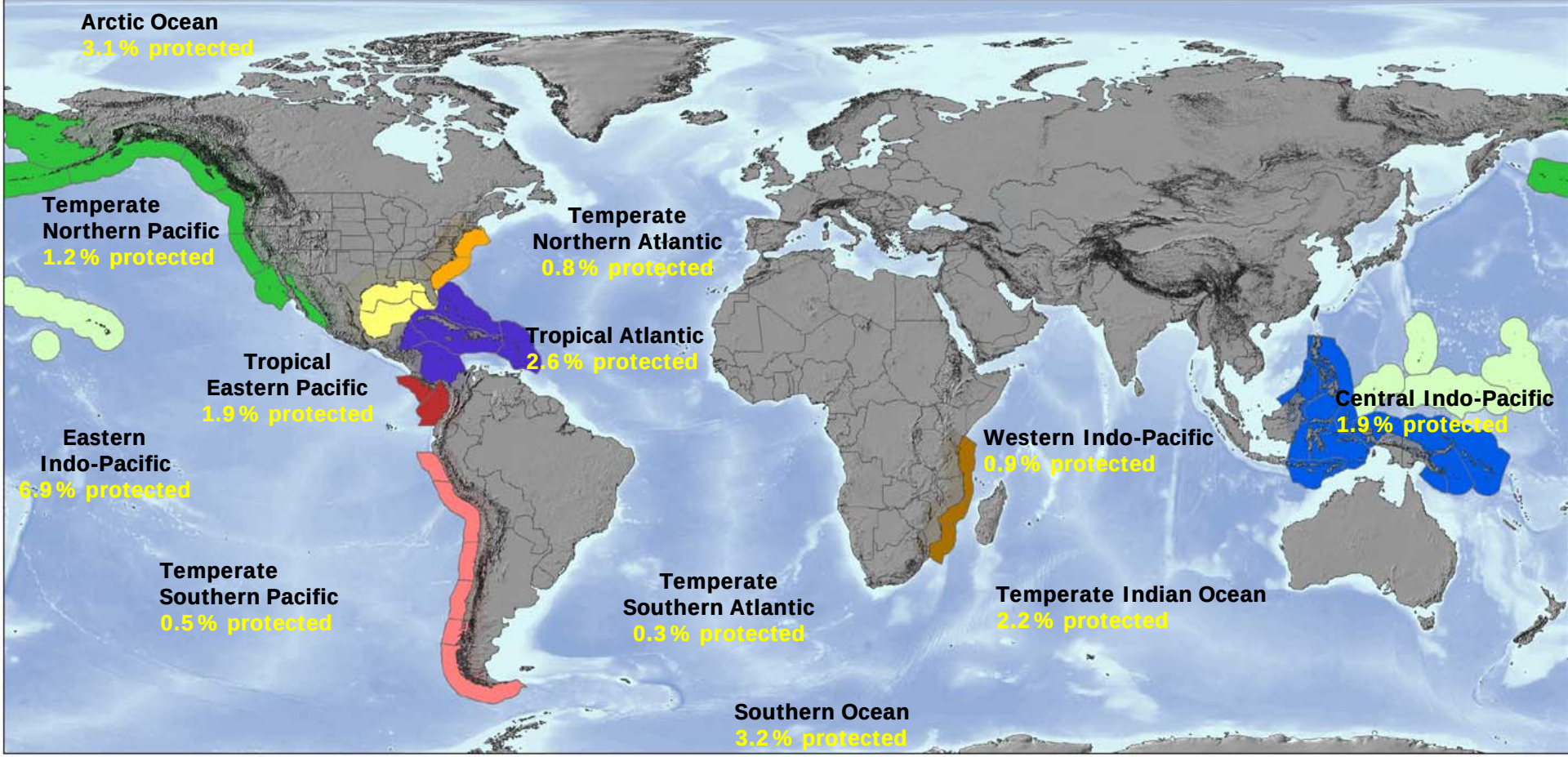

Ocean realms and % protected (MEOW 2006)

- Caribbean Basin
- Coral Triangle
- Eastern Tropical Pacific
- Gulf of Mexico
- North Pacific Marine
- Pacific Island Challenges
- Humboldt Coast & Current
- Coastal East Africa
- Temperate W. Atlantic

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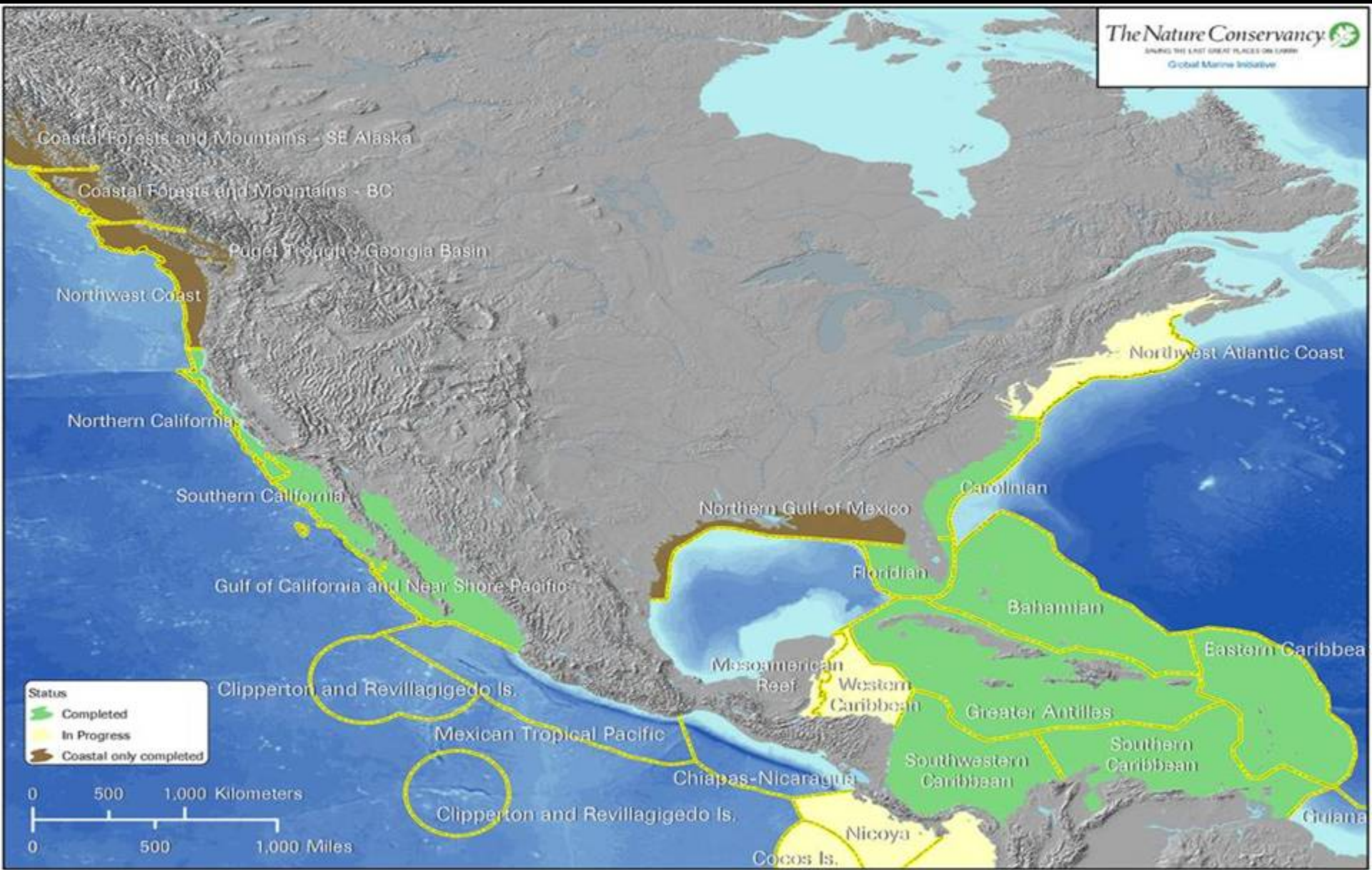
Priority Ocean Geographies

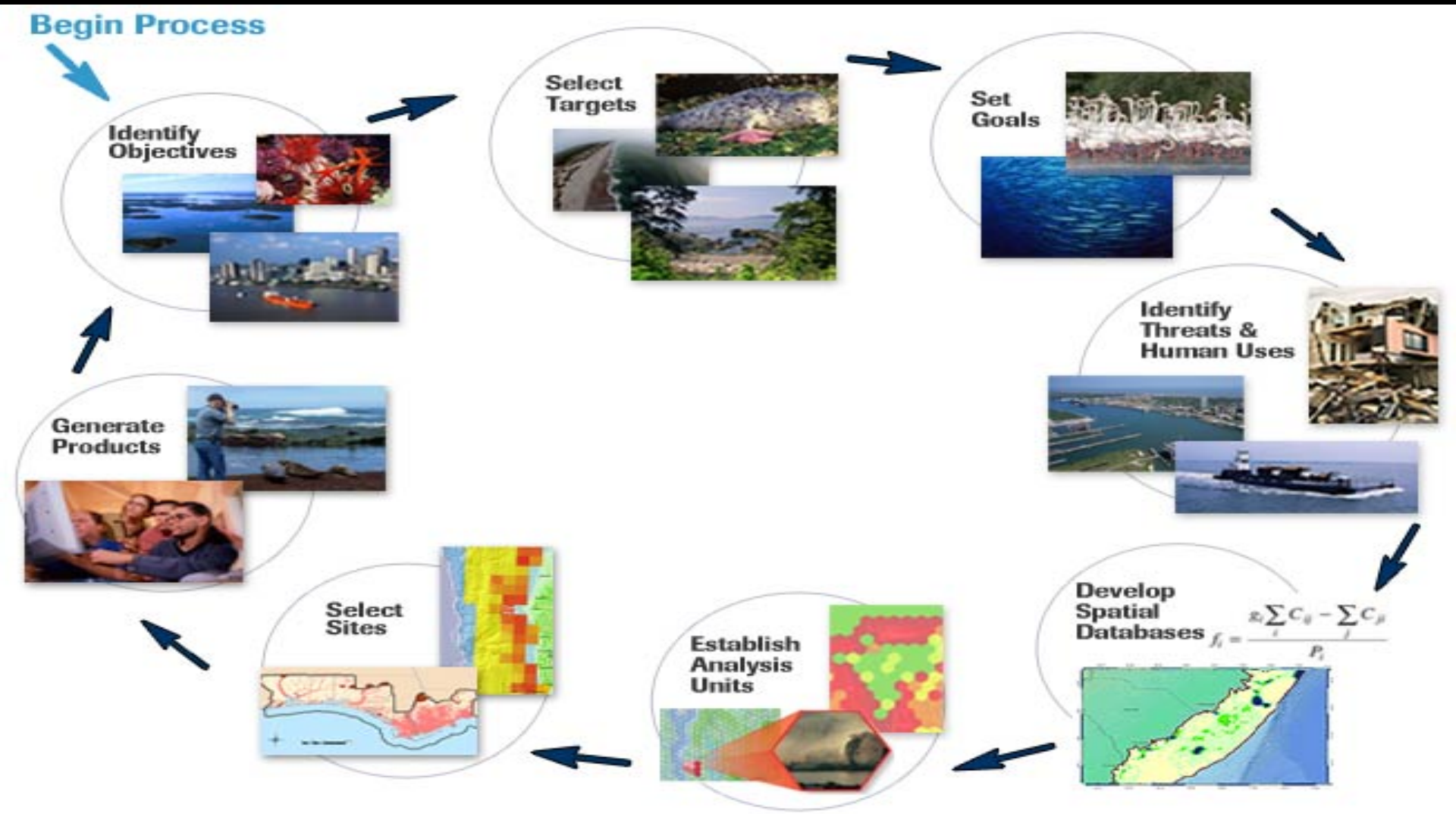
REGIONAL MARINE PROGRAM: ECOREGIONAL ASSESSMENT



Marine Ecoregional Assessments

- Integrated data on habitats, species and marine resource use -- baseline for EBM approaches
- ID sites representing diversity of habitats, natural communities, and species
- Informing strategies to protect sensitive living resources for multiple uses
- Next generation ERA: better characterization of connectivity, food web dynamics, GIS data showing resiliency to specific threats

THE PROCESS OF MARINE ECOREGIONAL PLANNING



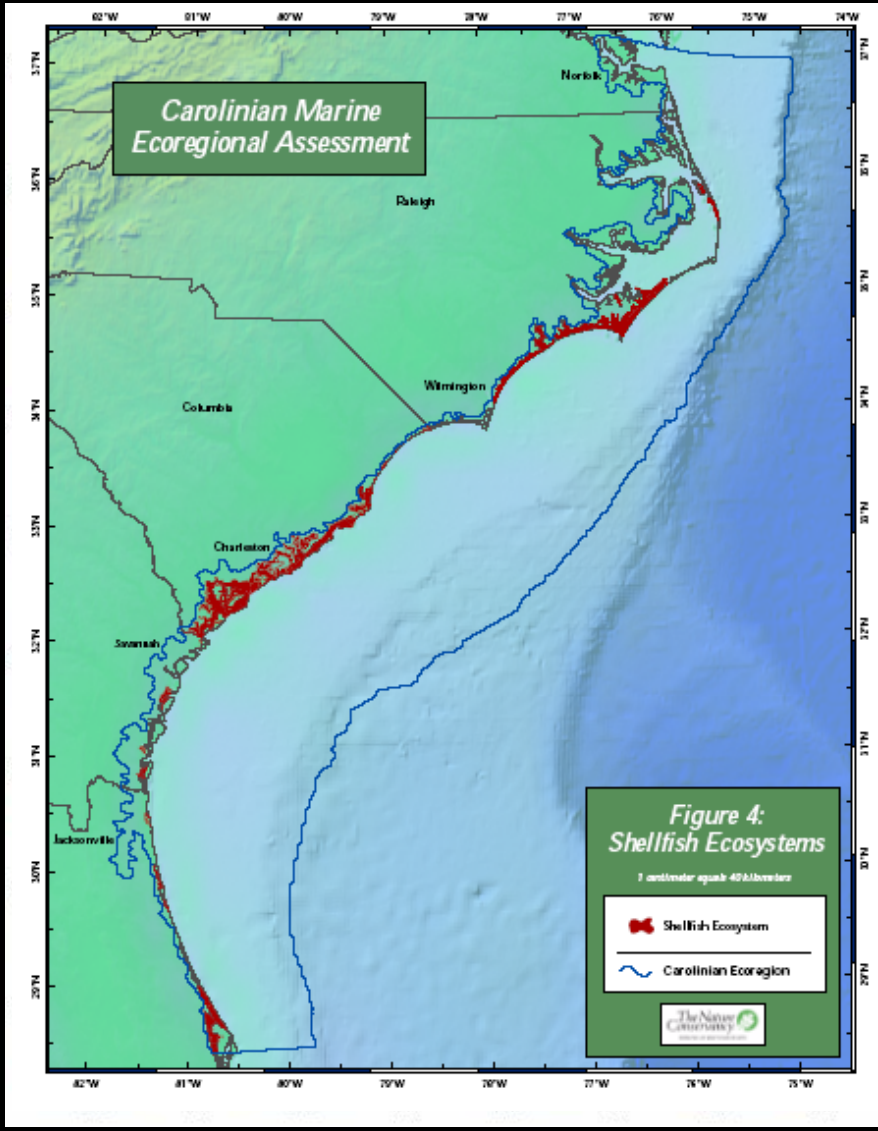
Carolinian Assessment

- Coastal waters of
  VA, NC, SC, GA, FL
- Tidal marshes to
  continental shelf (200 m)
- ~ 17.85 million hectares
- Contiguous with 5 other marine and terrestrial ecoregions

Conservation Targets

Mapped regional data for 36 targets (ecosystems and species):

- Salt and brackish marshes
- Oyster reefs
- Seagrasses
- Shoreline types
- Sea turtle nesting beaches
- Shorebird and water bird habitat
- Right whale calving grounds
- Short-nose sturgeon habitat
- Offshore reef and hard-bottom areas
- Benthic habitat types
- Habitat Areas of Particular Concern



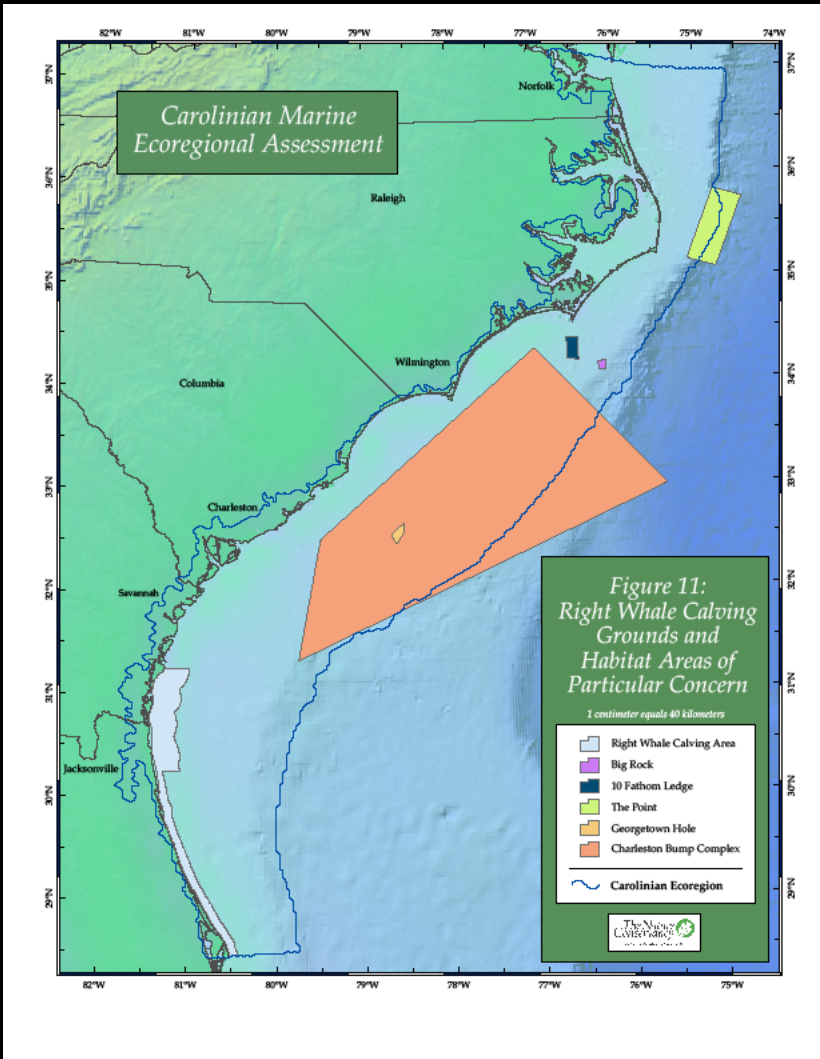
Right Whale Calving Grounds and HAPCs

Right Whale Calving Grounds

- Established by NMFS
- 500,000 hectares

Habitat Areas of Particular Concern (HAPCs)

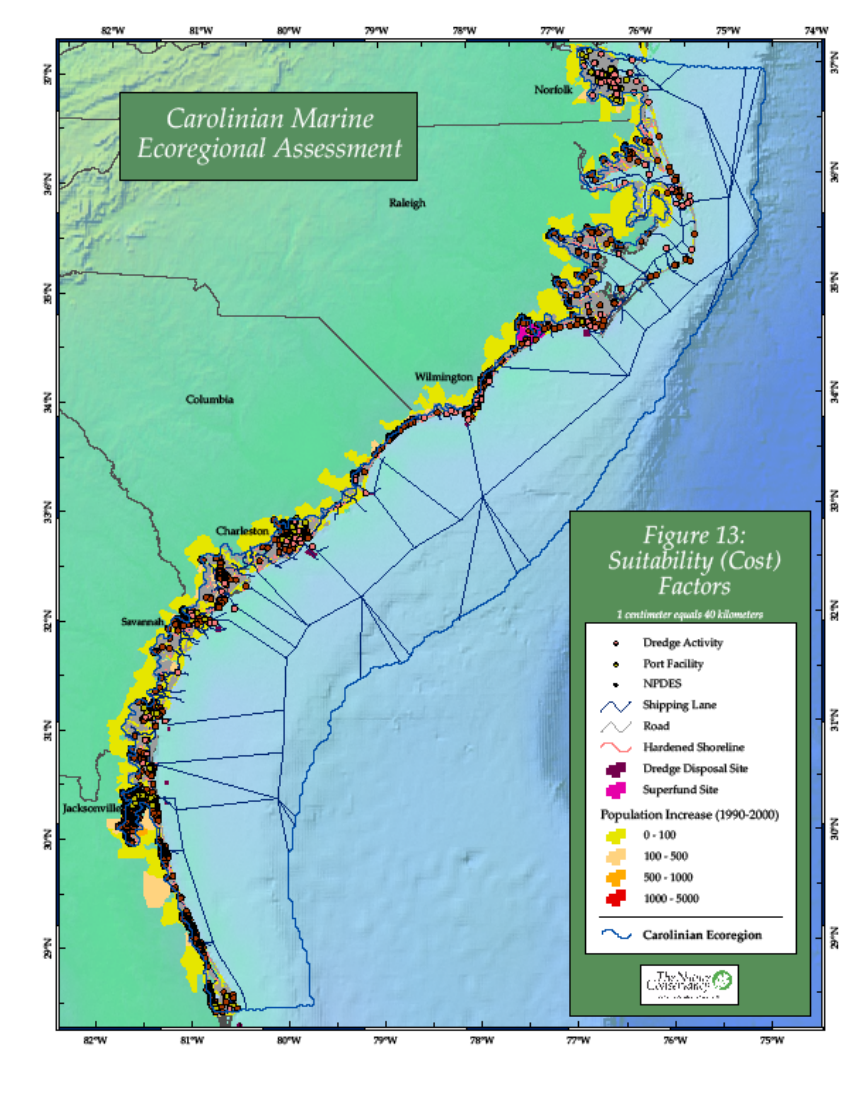
- Established by SAFMC
- Sites included were:
  - o Charleston Bump and Gyre Complex
  - o The Point
  - o Ten Fathom Ledge
  - o Big Rock



Suitability Index

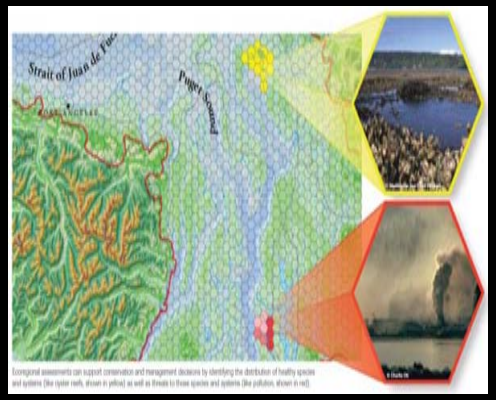
Mapped data for 10 “cost factors” to develop a Suitability Index:

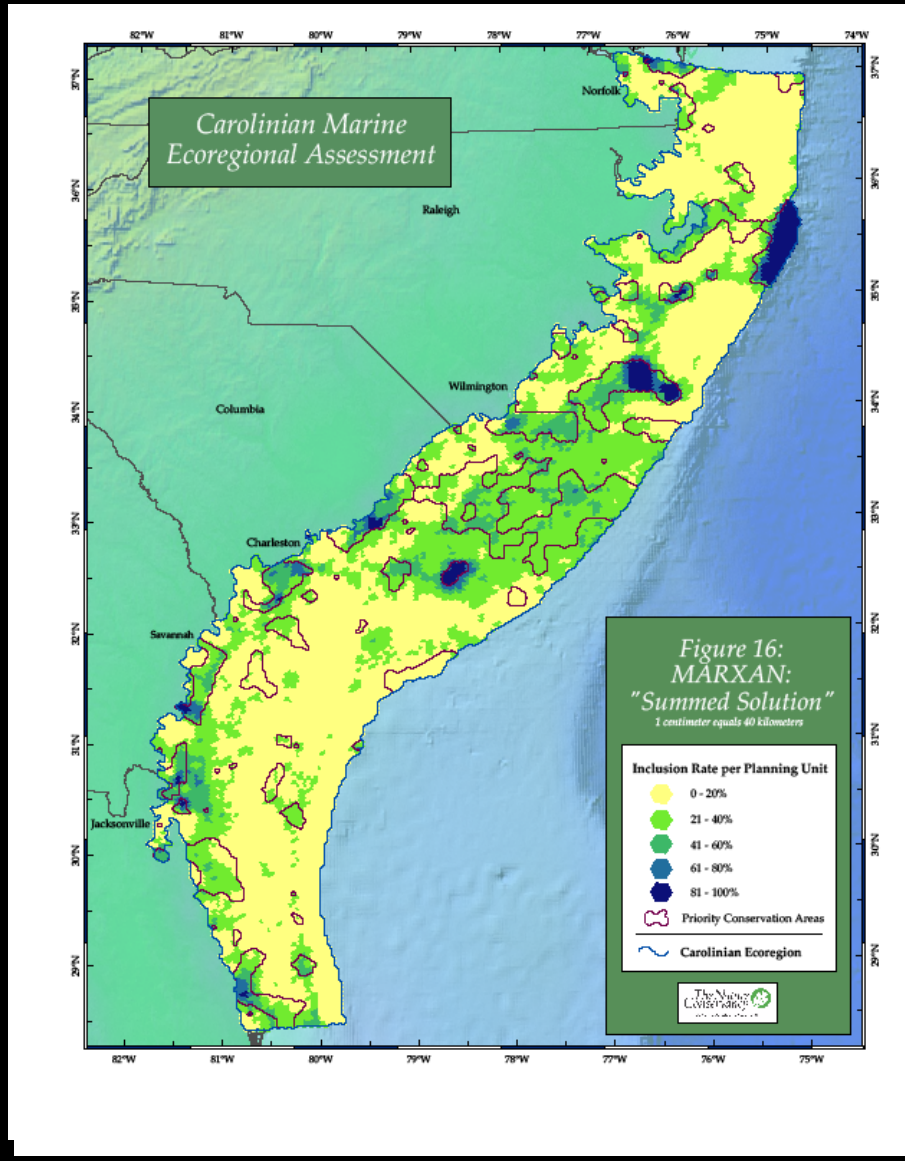
- population growth
- housing density
- road density
- major port facilities
- shipping lanes
- dredged channels
- hardened shorelines
- Superfund sites
- NPDES permits
- dredge disposal sites



Conservation Areas

- Subregions created to ensure adequate representation
- MARXAN used to identify conservation areas
- 41 areas, ~21 percent of the ecoregion (3.77 million hectares)
- 10 sites were identified as an initial priorities

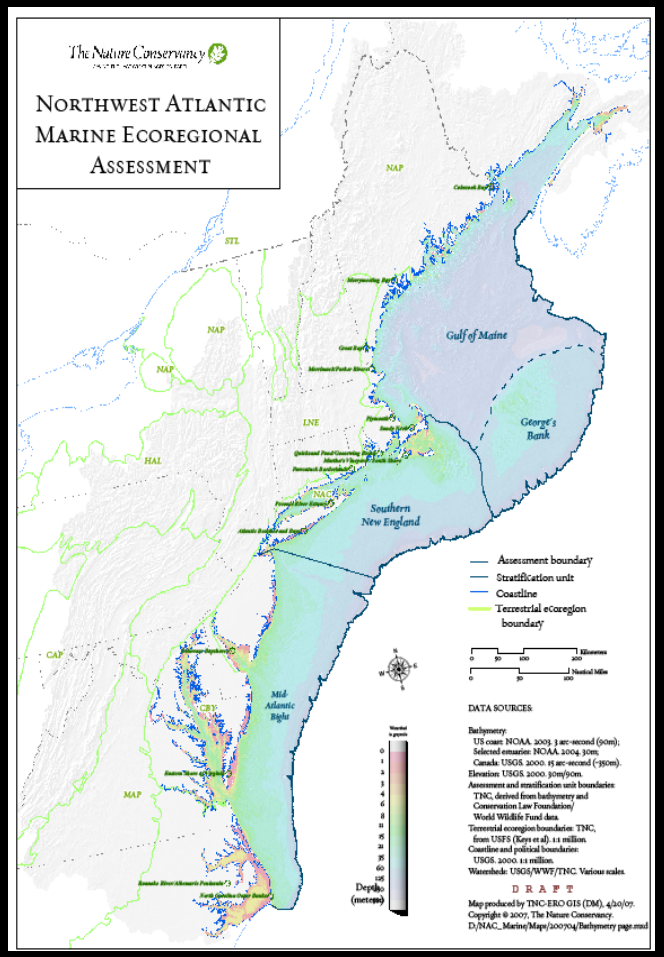




Data Gaps and Limitations

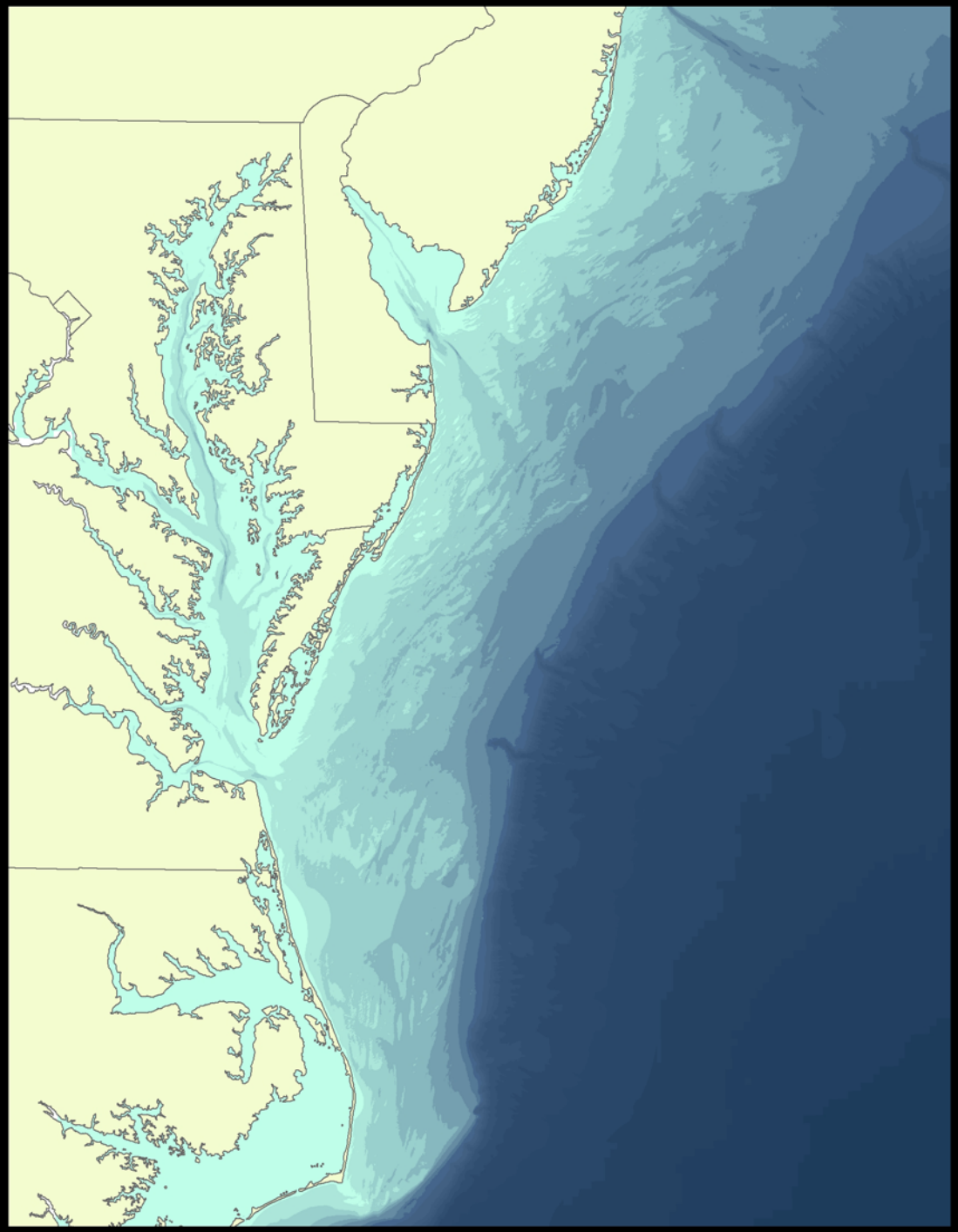
- Relied on regional data
- Connections between nearshore and offshore not incorporated
- Benthic structural complexity needs to be validated
- Offshore fish assemblages dependent on hard bottom, structural complexity (modeled) and HAPC data
- Costs primarily related to nearshore areas

Northwest Atlantic Marine Ecoregional Assessment

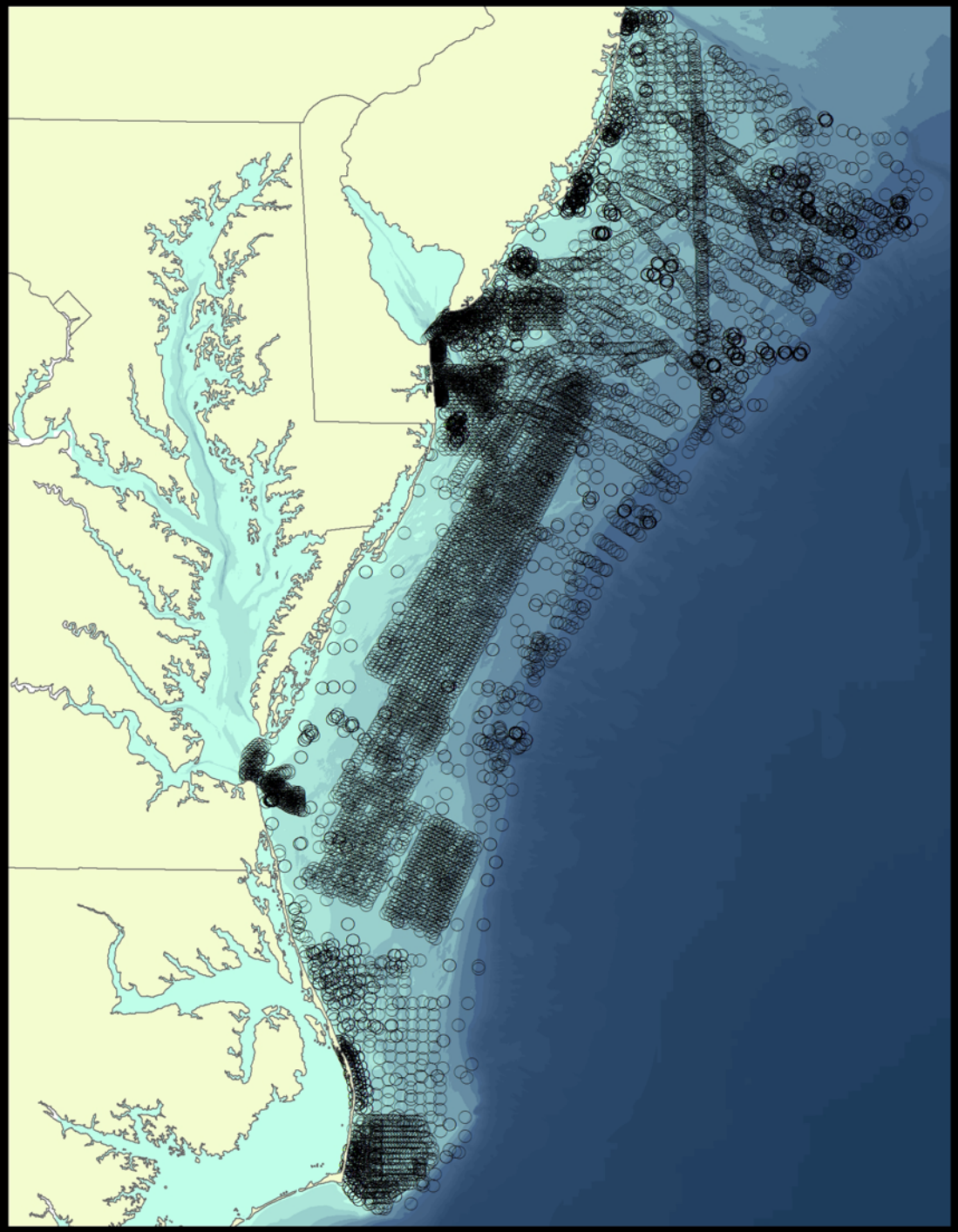


Planning Area Boundaries:

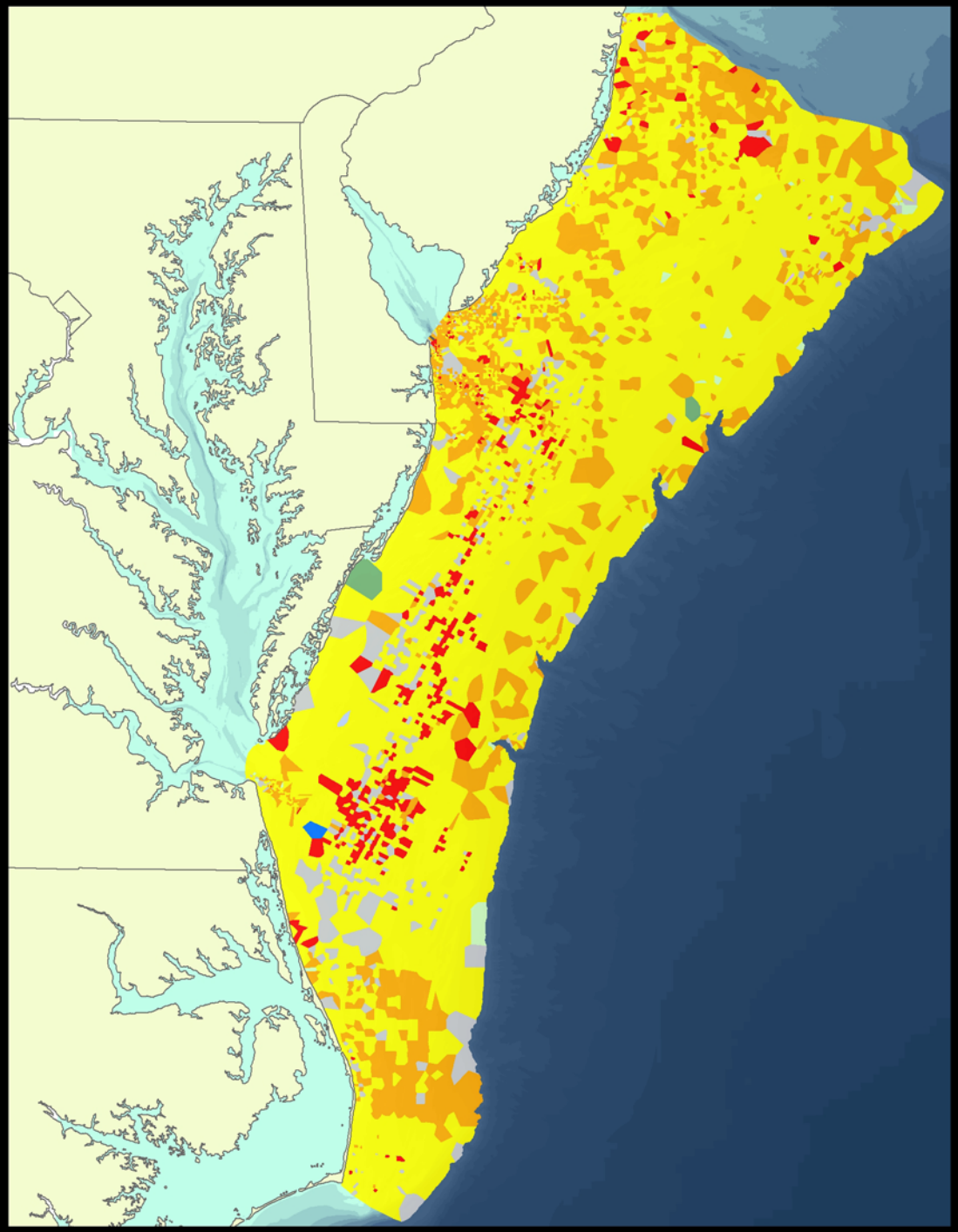
- Bay of Fundy to Cape Hatteras NC
- 3 subregion
  - Gulf of Maine/George's Bank
  - Southern New England
  - Mid Atlantic Bight
- Bay mouths and inlets out to continental shelf edge



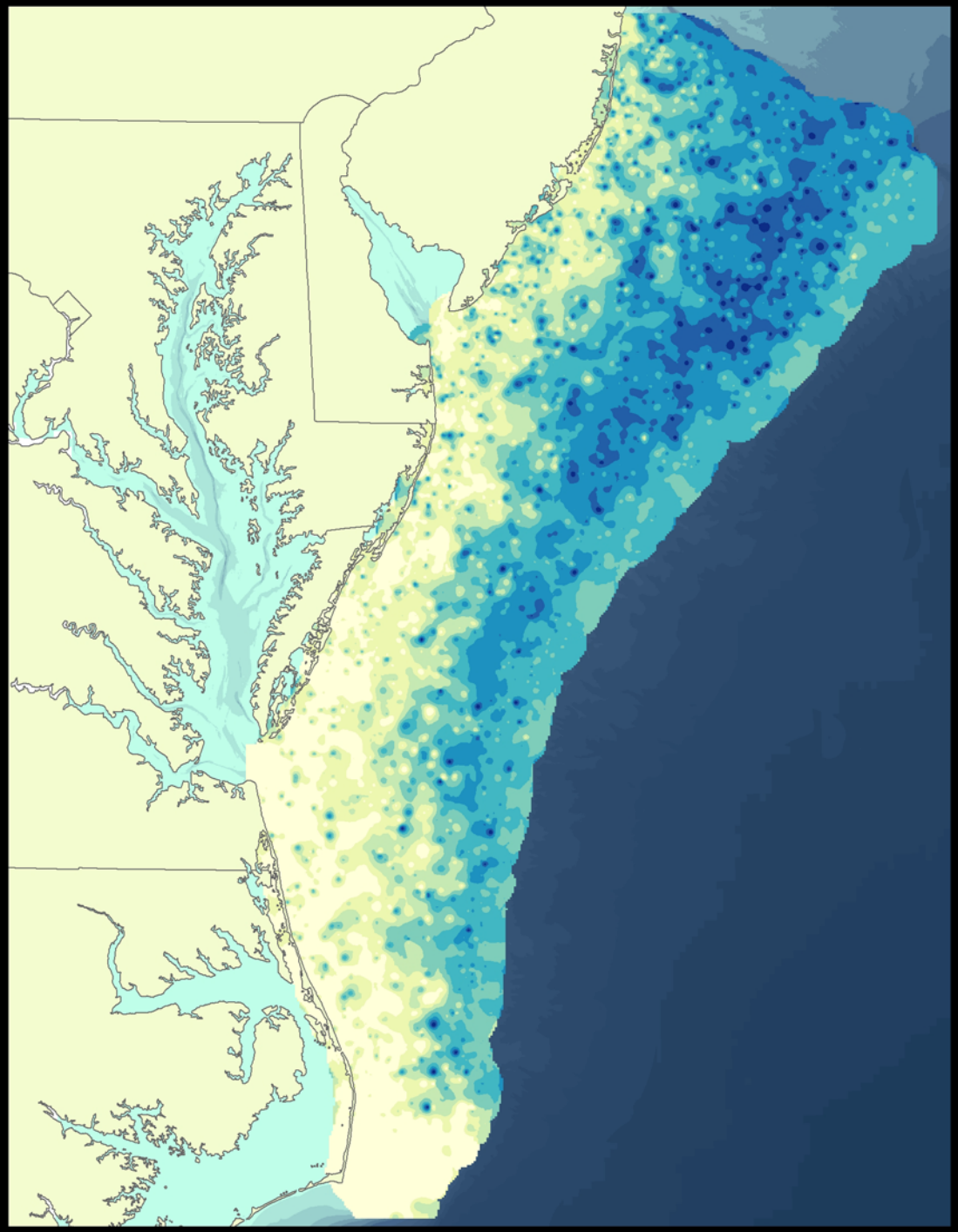
- Mid-Atlantic Seascape
- Cape Hatteras to Cape May (Hudson Canyon)
- Bathymetry, shoreline, and State boundaries



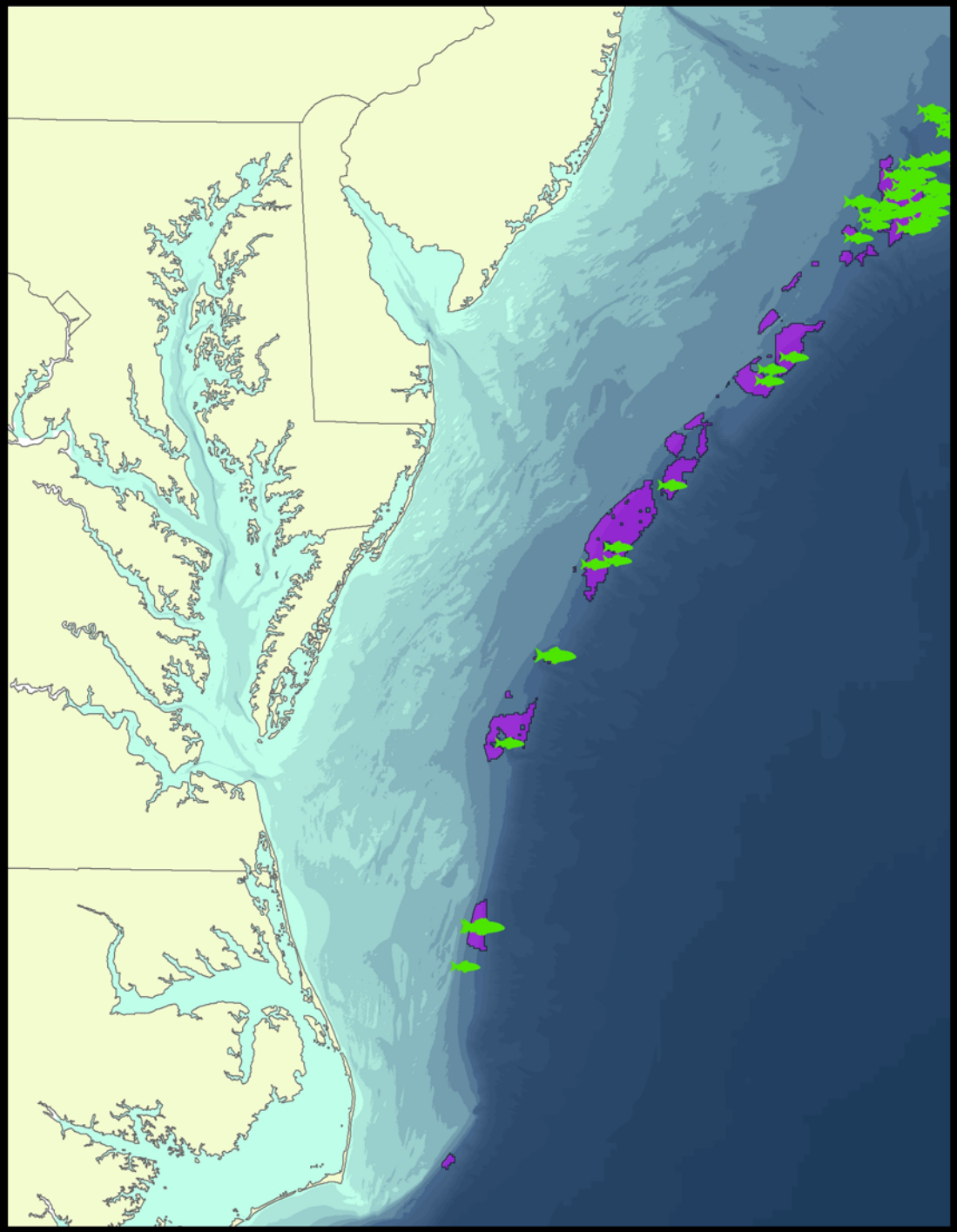
- USGS Sediment database (SEABED)
- Compilation of several surveys, point data



- Sediment map interpolated from USGS point data

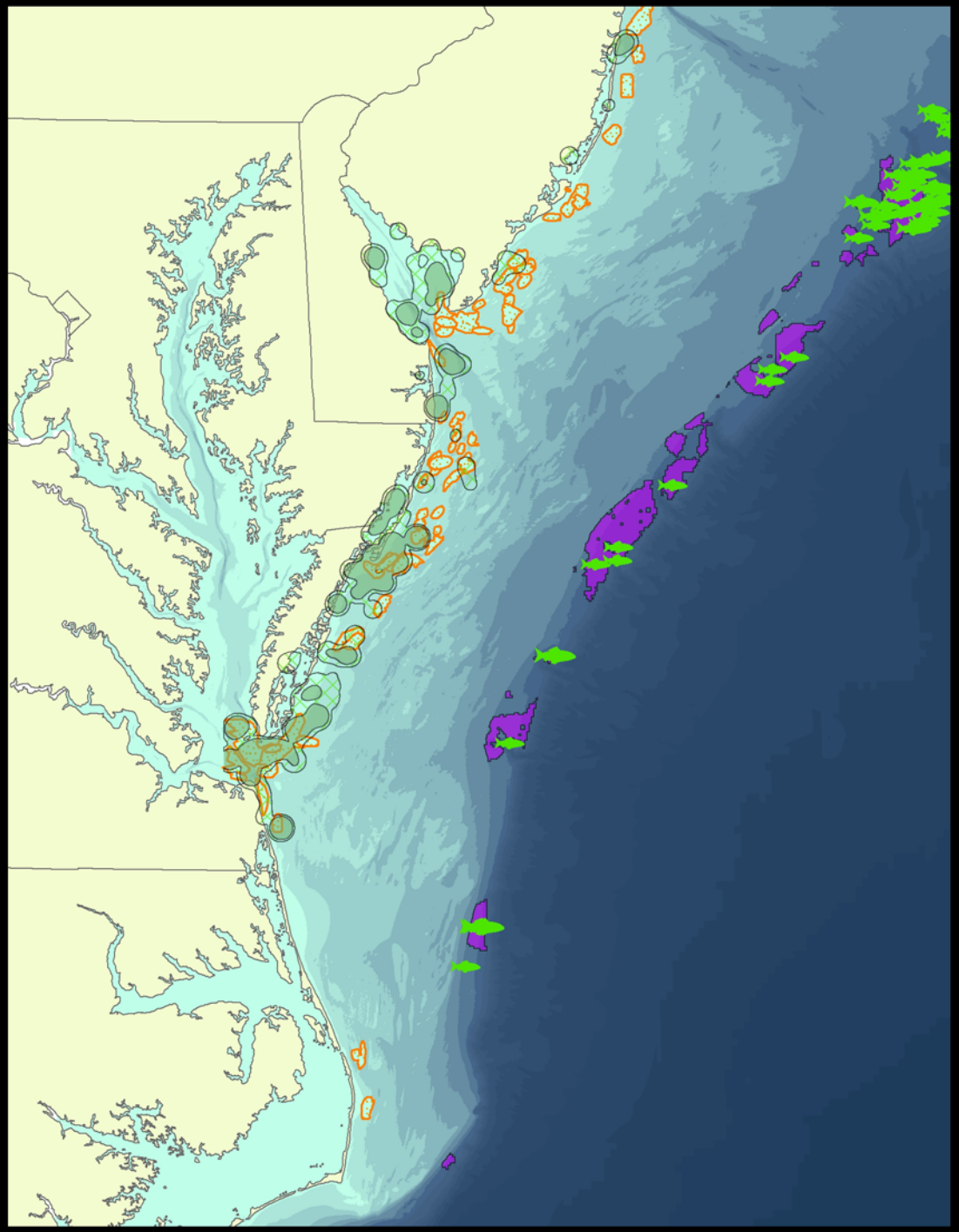


- Water temperature data
- Interpolated from NMFS trawl survey data
- Being replaced with more robust modeled approach with assistance from experts

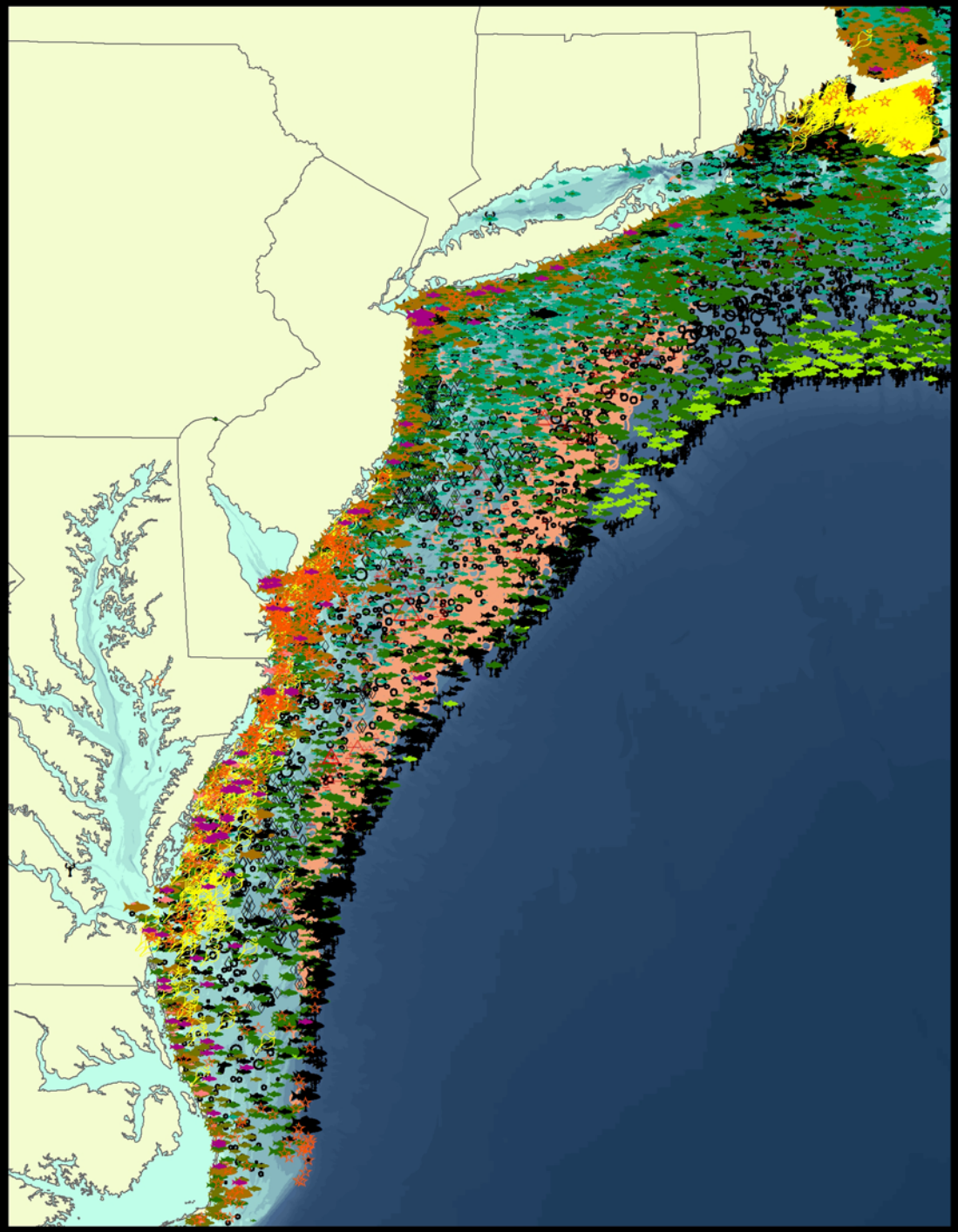


- Tilefish habitat model
- Based on depth, substrate, temperature

- Tilefish from NMFS trawl survey



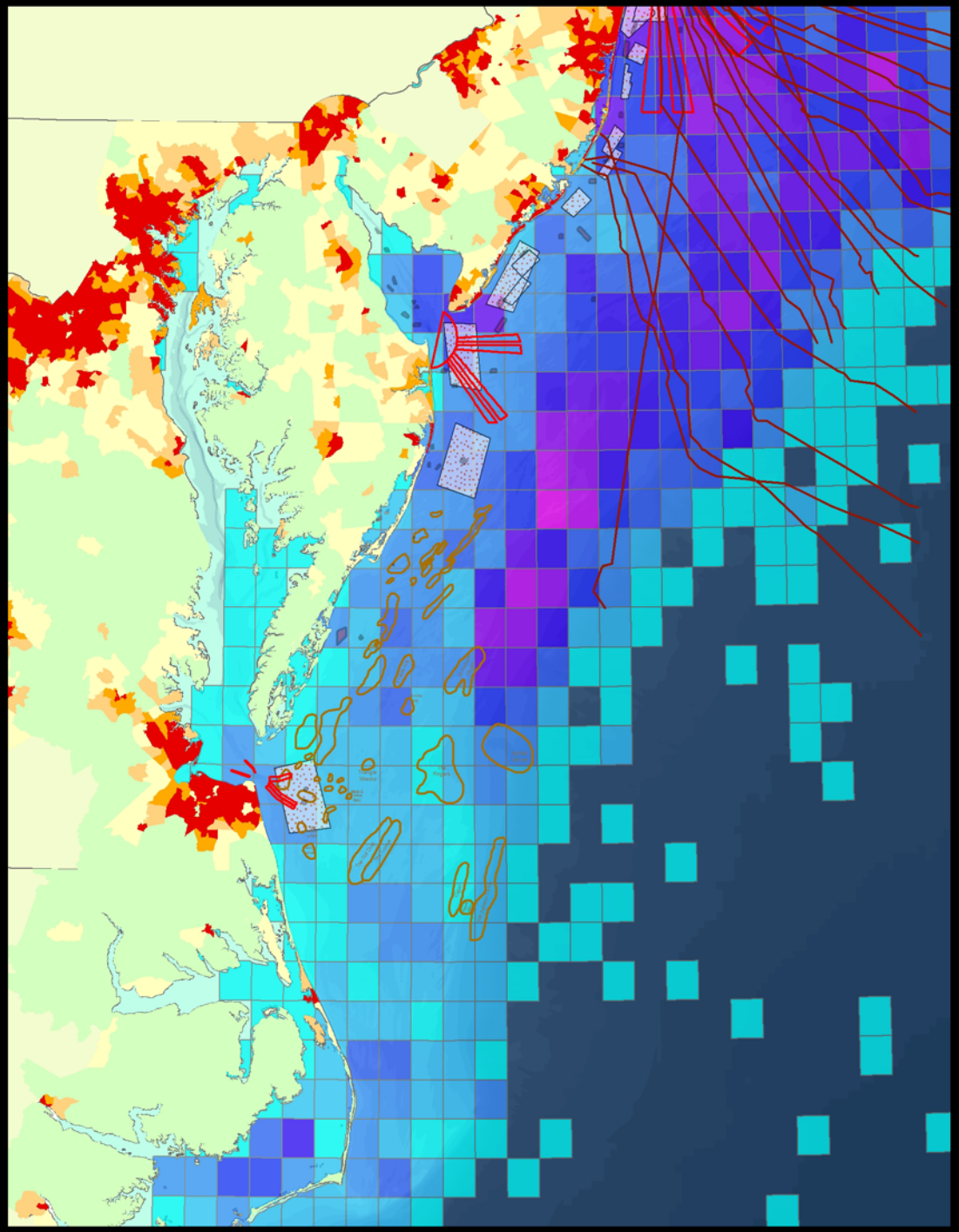
- Tilefish
- Shoals (NOAA data)
- Waterbird concentration areas (USFWS point data)



NMFS Trawl Survey Data

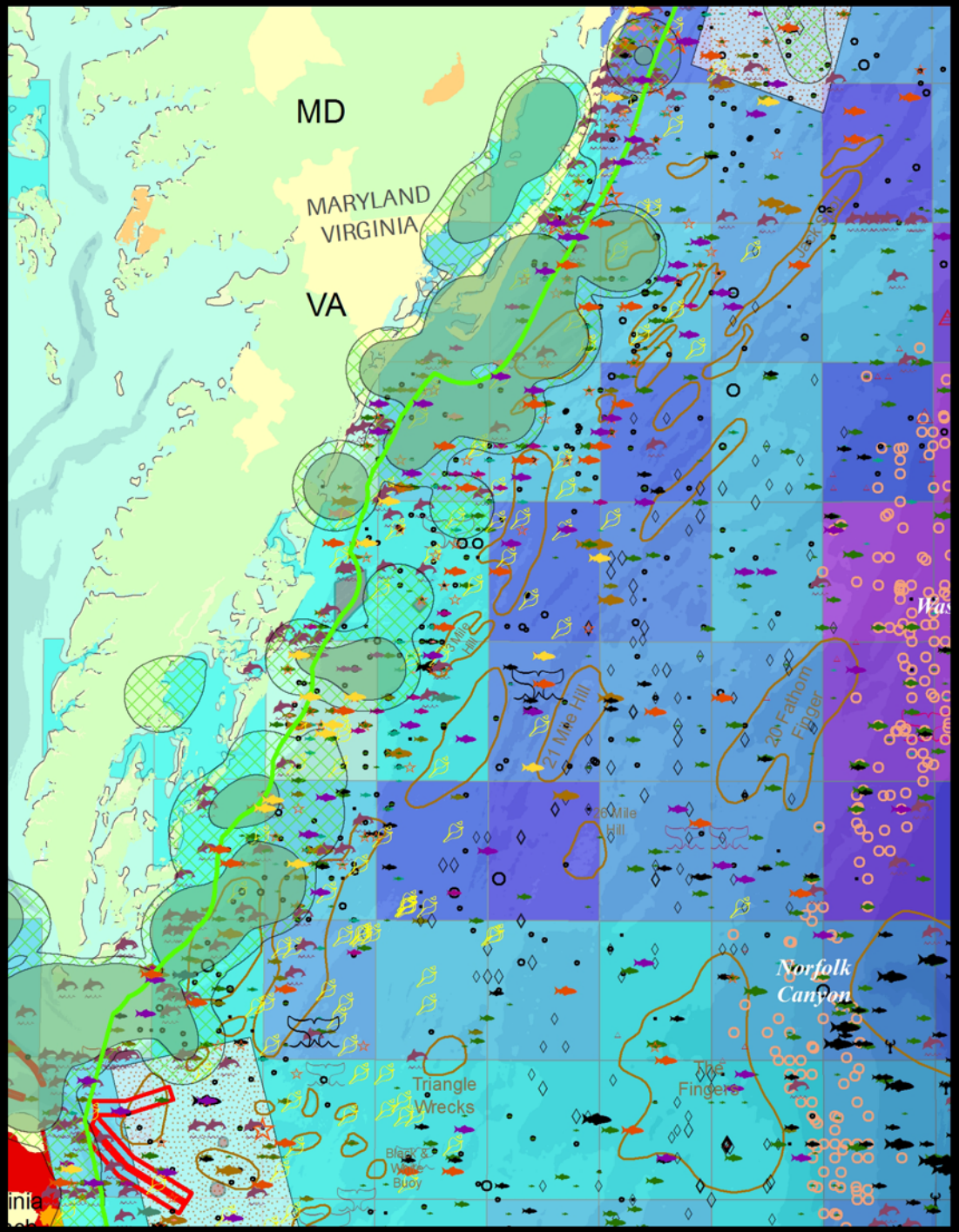
- Tilefish
- Menhaden
- Lobster
- Sea scallops
- Surf clams
- Winter flounder, summer flounder, black sea bass, tautog, sturgeon, N. sand lance, Atlantic mackerel, ocean quahog, whelks, horseshoe crab

- ➢ Not shown: ~500 other trawl species &
- ➢ Benthic survey data
- ➢ Next steps: produce EMUs integrating species-habitat data, showing relationships



Mid-Atlantic Seascape: Human Use Data

- Population density
- Sand mining areas
- Shipping lanes
- Telecommunications cables
- Recreational fishing areas & artificial reefs (placeholder)
- Commercial fishing:
- Gillnets
- Otter trawl
- All gears combined (29 types)



Mid-Atlantic Seascape: North and South ends

- Population density
- Sand mining areas
- Shipping lanes
- Telecommunications cables
- Recreational fishing (placeholder)
- Commercial fishing:
- Gillnets
- Otter trawl
- All gears combined

Utility of Ecoregional Assessments

- Decision support for locating energy infrastructure, aquaculture, dredging & spoil disposal, etc.
- Baseline information to support regional ocean governance initiatives
- Blueprint for biodiversity to support ecosystem based management approaches
- Enable marine spatial planning for multiple objectives

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QUESTIONS?