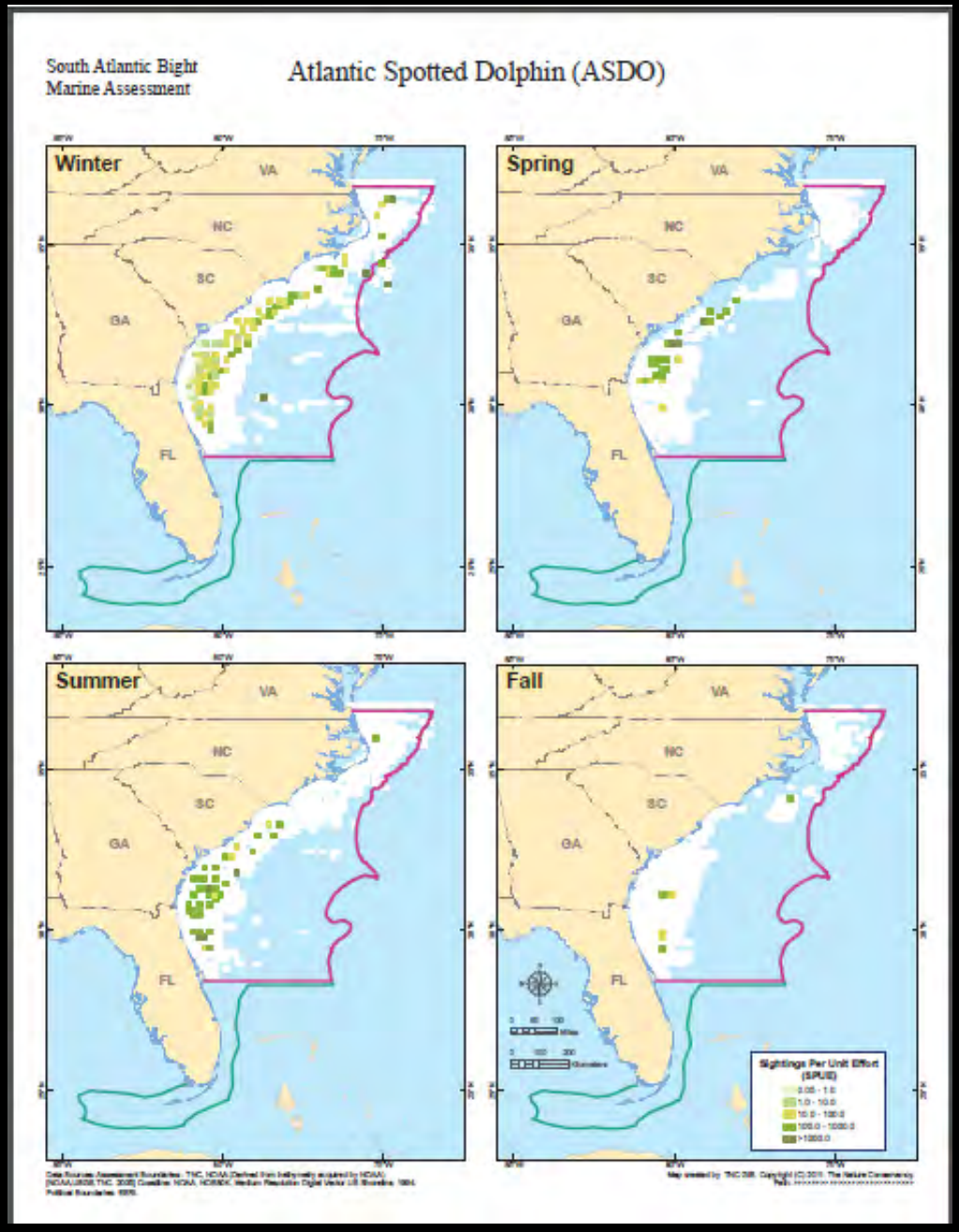
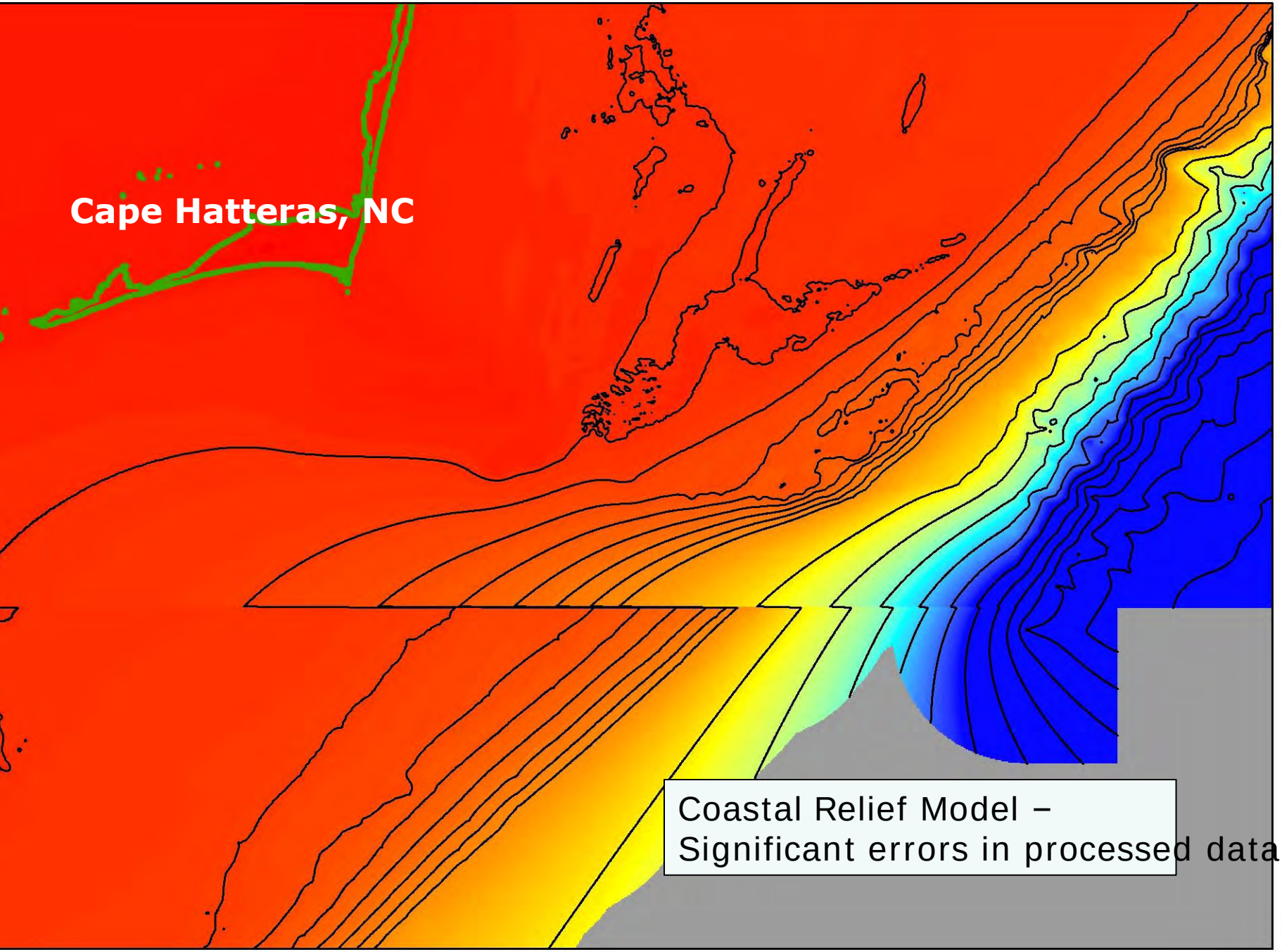
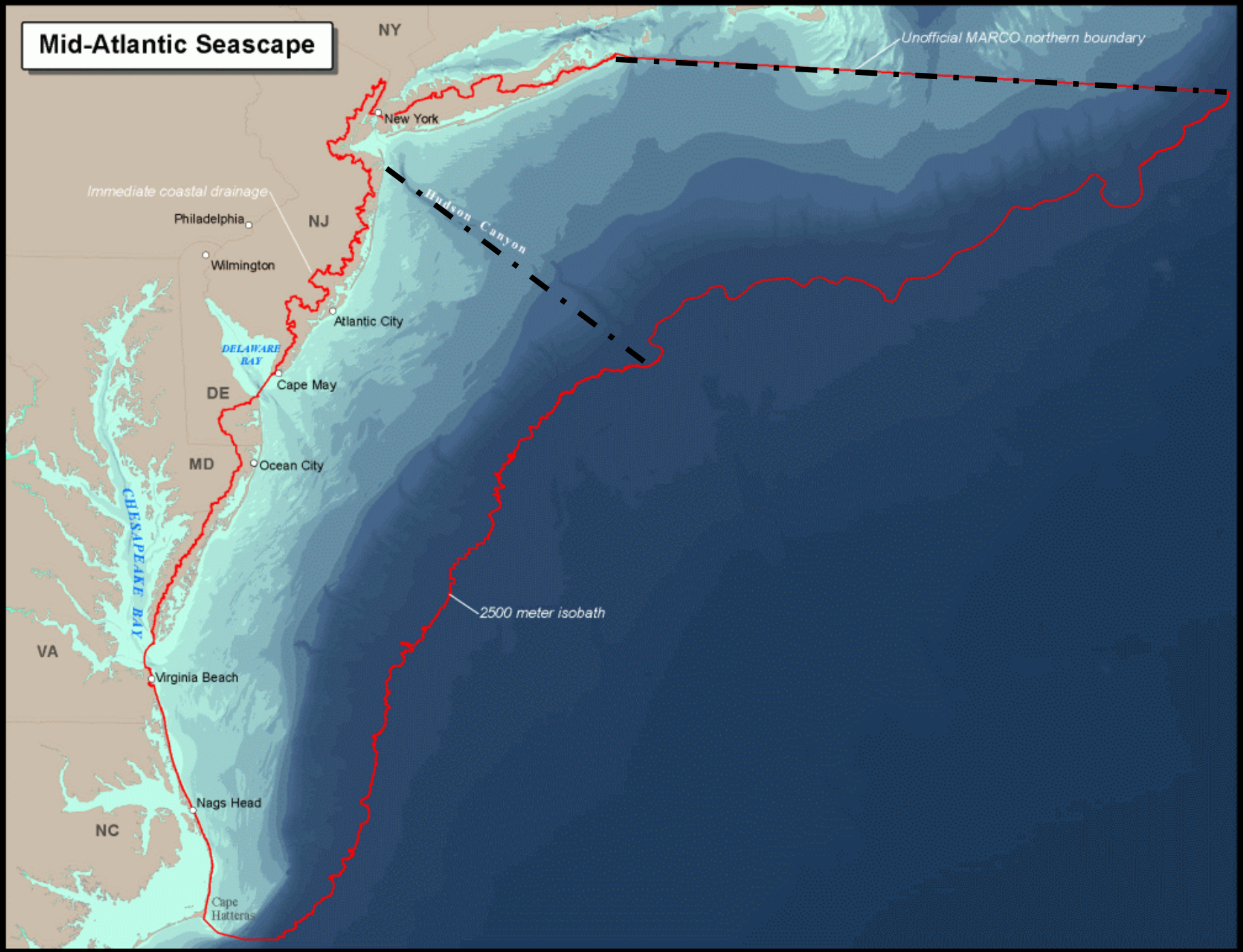
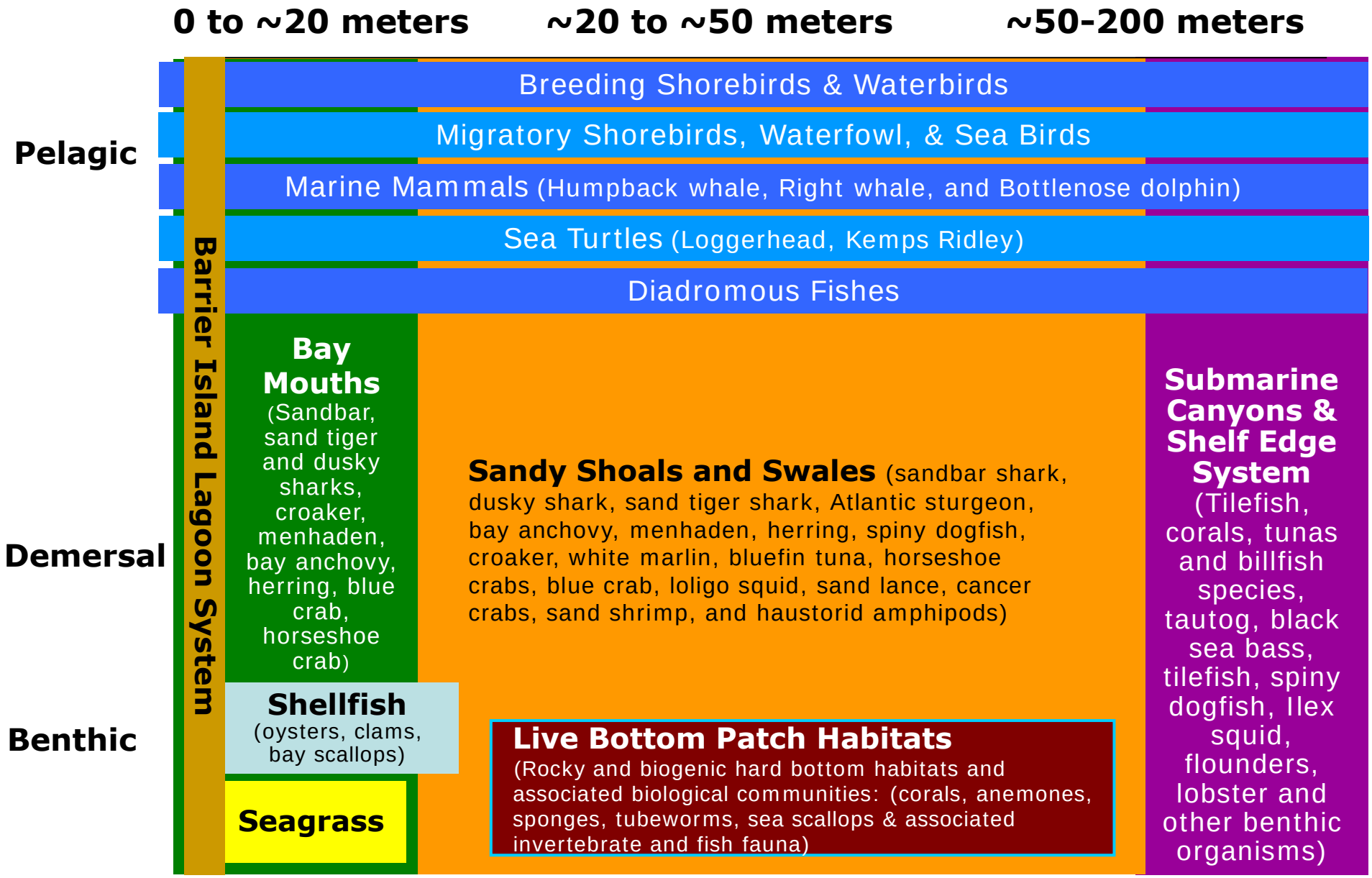


Marine Mamma
And Sea Turtles


Cape Hatteras, NC
Coastal Relief Model –
Significant errors in processed data


Mid-Atlantic Seascape
NY
Unofficial MARCO northern boundary
New York
Immediate coastal drainage
Philadelphia
NJ
Hudson Canyon
Wilmington
Atlantic City
DELAWARE BAY
Cape May
DE
MD
Ocean City
CHESAPEAKE BAY
2500 meter isobath
VA
Virginia Beach
Nags Head
NC
Cape Hatteras

Mid-Atlantic Seascape Conservation Targets



Threats Across Targets		Barrier island lagoon system	Breeding shorebirds and waterbirds	Migratory shorebirds, waterfowl, and sea birds	Seagrass	Shellfish beds and reefs	Diadromous fishes	Bay mouths	Sandy shoals and swales	Live bottom patch habitats	Marine mammals	Sea turtles	Shelf edge and submarine canyons	Saltmarsh	Overall Threat Rank
Project-specific threats		1	2	3	4	5	6	7	8	9	10	11	12	13	
1	Ocean acidification (GCC)	High	High	Medium	Medium	Medium	High	Medium	High	High	High	High	High	Medium	Very High
2	Catastrophic oil spills	High	Medium	High	High	High	Low	High	Medium	Medium	Medium	High	Low	High	Very High
3	Altered temperature regime (GCC)	High	Medium	Medium	High	Low	Medium	Medium	High	Low	High	High	Medium	Medium	Very High
4	Shoreline hardening & Jetties	Very High	High	Medium			Low	Medium	-			Low		Medium	High
5	Bottom contact fishing (includes oyster harvest)	Medium			Medium	Medium	Medium	Low	High	High	Low	High	Medium		High
6	Coastal sand mining	High		High			Low	Medium	High	Medium	Medium	Medium			High
7	Shoreline development & marinas	High	High	Medium								High		Medium	High
8	Shipping Lanes										Very High	Medium			High
9	Oil & Gas Development (potential)	High	Medium	Medium	Low		Low	Low	Medium	Medium	Medium	Low	High		High
10	Gill nets	Low		Medium			Medium	Medium	Medium	Low	High	High			High
11	Nutrient loading	High	Low	Low	High	Low	Medium	Medium	Low			Medium		Low	High
12	Invasive & aggressive species	Medium	High		Medium	Medium	Low	Medium		Medium			Low	Medium	High
13	Dredging & marine construction	Medium		Low	Medium	Low		Medium				High		Medium	Medium
14	Harmful algae blooms	High	Medium	Medium							Medium	Medium			Medium
15	Sea level rise (GCC)	Medium	Medium	Medium	Medium									High	Medium
16	Disease & pathogens				Medium	High					Medium	Medium			Medium
17	Trap fisheries	Medium							Low	Low	High	Medium			Medium
18	Marine debris		Medium	Low							Medium	High			Medium
19	Excess sediments	Medium			High	Medium									Medium
20	Chemical & metal pollution	Medium	Medium	Medium		Low	Medium			Low	Medium	Medium	Low		Medium
21	Derelict fishing gear	Low		Low			Low	-	Medium	Medium	Medium	Medium			Medium
22	Pelagic trawls (seines & midwater)			Medium			Medium		Medium		Low	Medium	Low		Medium
23	Beach recreation	Medium	Medium	Low								Medium			Medium
24	Offshore aquaculture			Medium							Medium	Medium			Medium
25	Longlines	Low		Low				Low		Low	Low	Medium	Medium		Medium
26	Hook & Line	Low					Low	-	Low	Medium		-	Medium		Medium
27	Power boating				Medium							Medium			Medium
28	Wind power infrastructure			Low					Medium	Low	Low	Low			Low
29	Biomass energy development	Low			Medium						Low	Low			Low
30	Millitary sonar										Medium		Low		Low
31	Mooring lines										Medium				Low
32	Hydrokinetic energy development						Low	Low				Low			Low
33	Ditches, berms, tide gates, and culverts													Low	Low
34	Inshore aquaculture				Low										Low
35	Whale watching										Low				Low
Threat Status for Targets and Project		Very High	High	High	High	High	High	High	High	High	Very High	Very High	High	High	Very High

Threat summary

- Bottom disturbance: fishing, dredging, sand mining, marine construction, wind power
- Threats to T&E species: ship traffic, fishing in wrong place with wrong gear at wrong time, wind power, threats outside the Mid
- Biomass removal: too much and/or wrong kind
- Human response to sea level rise
- Pollution: nutrients/sediments in estuaries, catastrophic oil releases
- Loss of critical habitats: seagrass, oysters, hard bottom communities

MAS Conservation Planning Approach

Aim very high – ‘blue sky’ vision:
What does really winning look like?

Pragmatically, identify priority strategies and achievable short / medium term goals

Inspire funders & partners to invest in all strategies to reach longer term goals

Vision

The culture and practice of Mid-Atlantic Seascape management is transformed through adoption of biodiversity conservation values and ecosystem based approaches.

New institutions are authorized and equipped to articulate and democratically select ecosystem goals, providing adaptive management measures as needed.

Four Strategy Themes

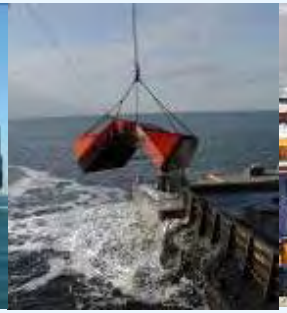
- Conservation of Highly Migratory Species
- Restoration
- Fisheries Policy Engagement
- Coastal and Marine Spatial Planning (foundation for EBM)

What's going on in the 'Mid'?











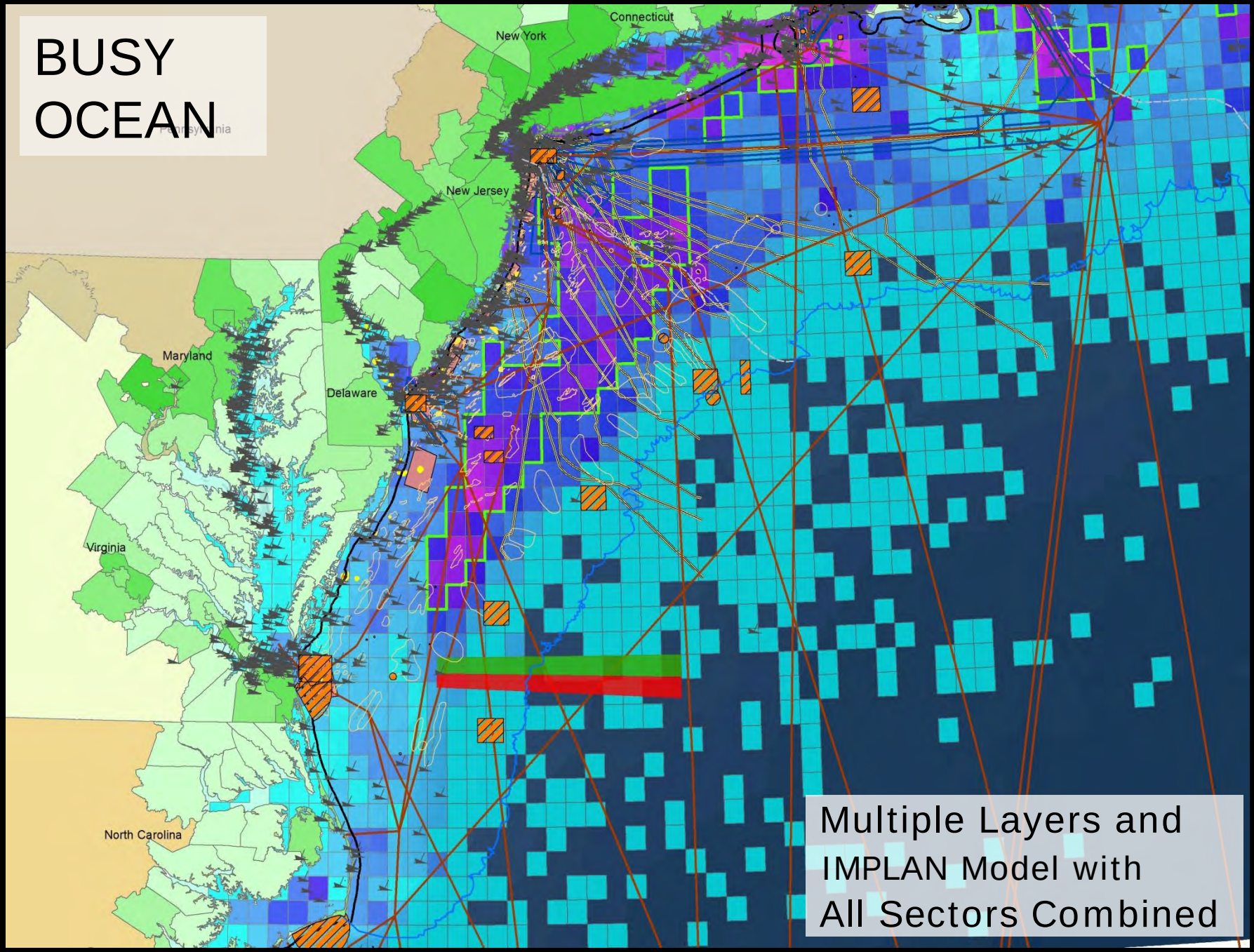




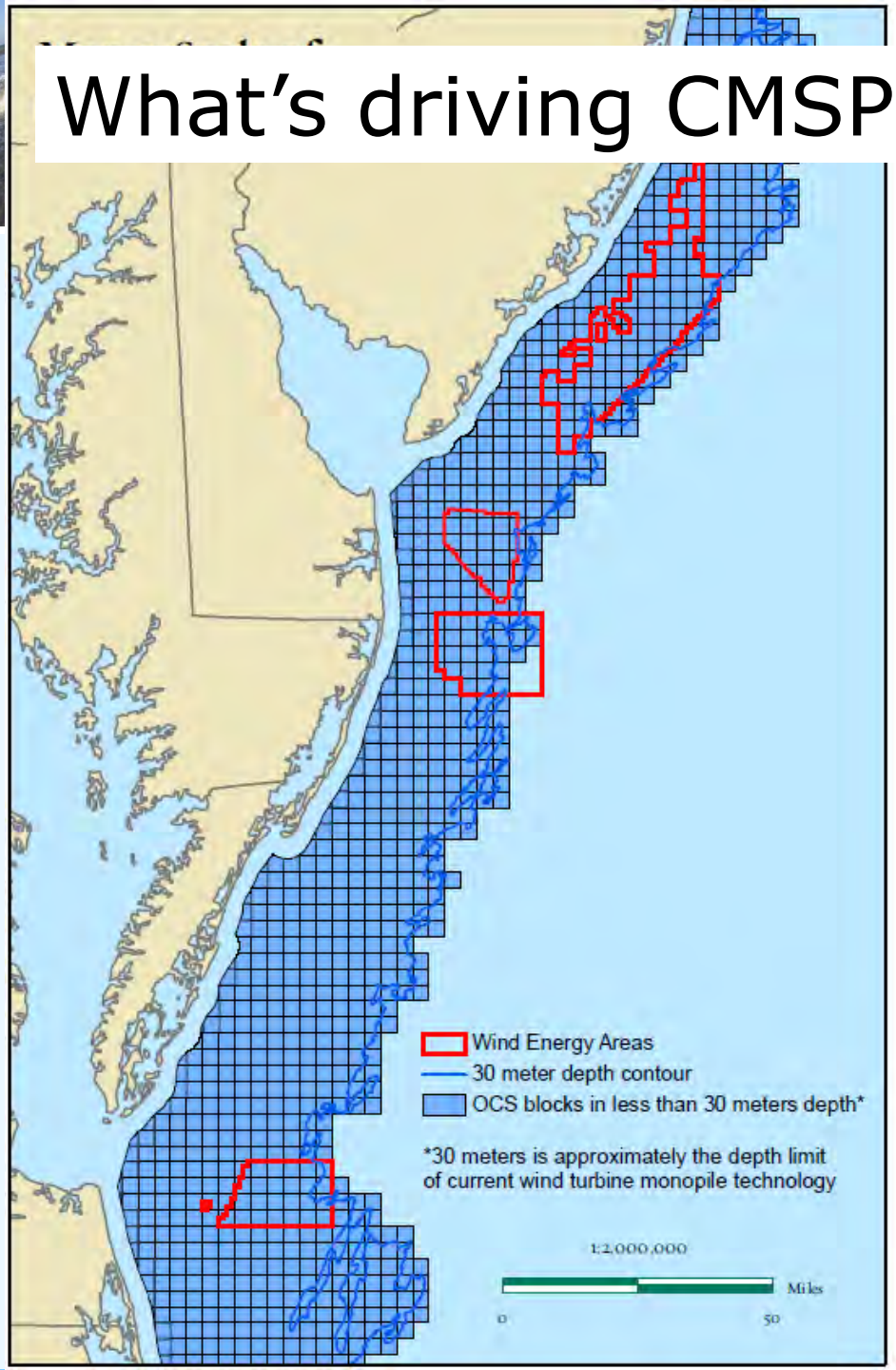
MARCO

Fisheries Management Culture Shift

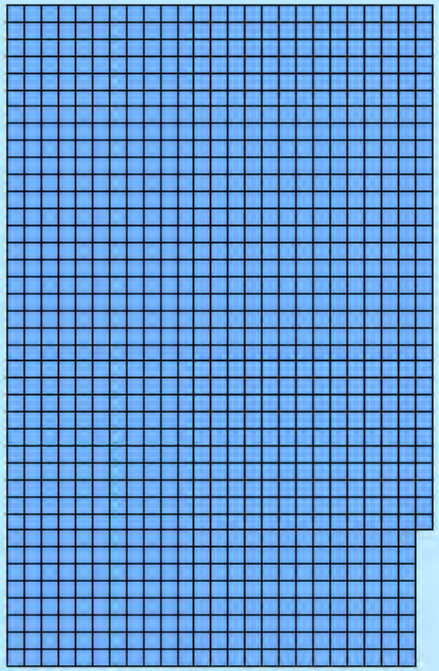
Mid Atlantic Fisheries Management Council


BUSY OCEAN
Connecticut
New York
New Jersey
Maryland
Delaware
Virginia
North Carolina
Multiple Layers and IMPLAN Model with All Sectors Combined

What's driving CMSP in the Mid-Atlantic?



of offshore wind generating capacity. Assuming 3.0 megawatt turbines with a capacity factor of 38%, 47,368 turbines would be required to reach 54 gigawatts. Assuming spacing that would allow 49 turbines per OCS block, 967 OCS blocks would be required. The area below shows 967 OCS blocks at the same scale as the map on the left.



The Nature Conservancy
Protecting nature. Preserving life.

1:2,000,000
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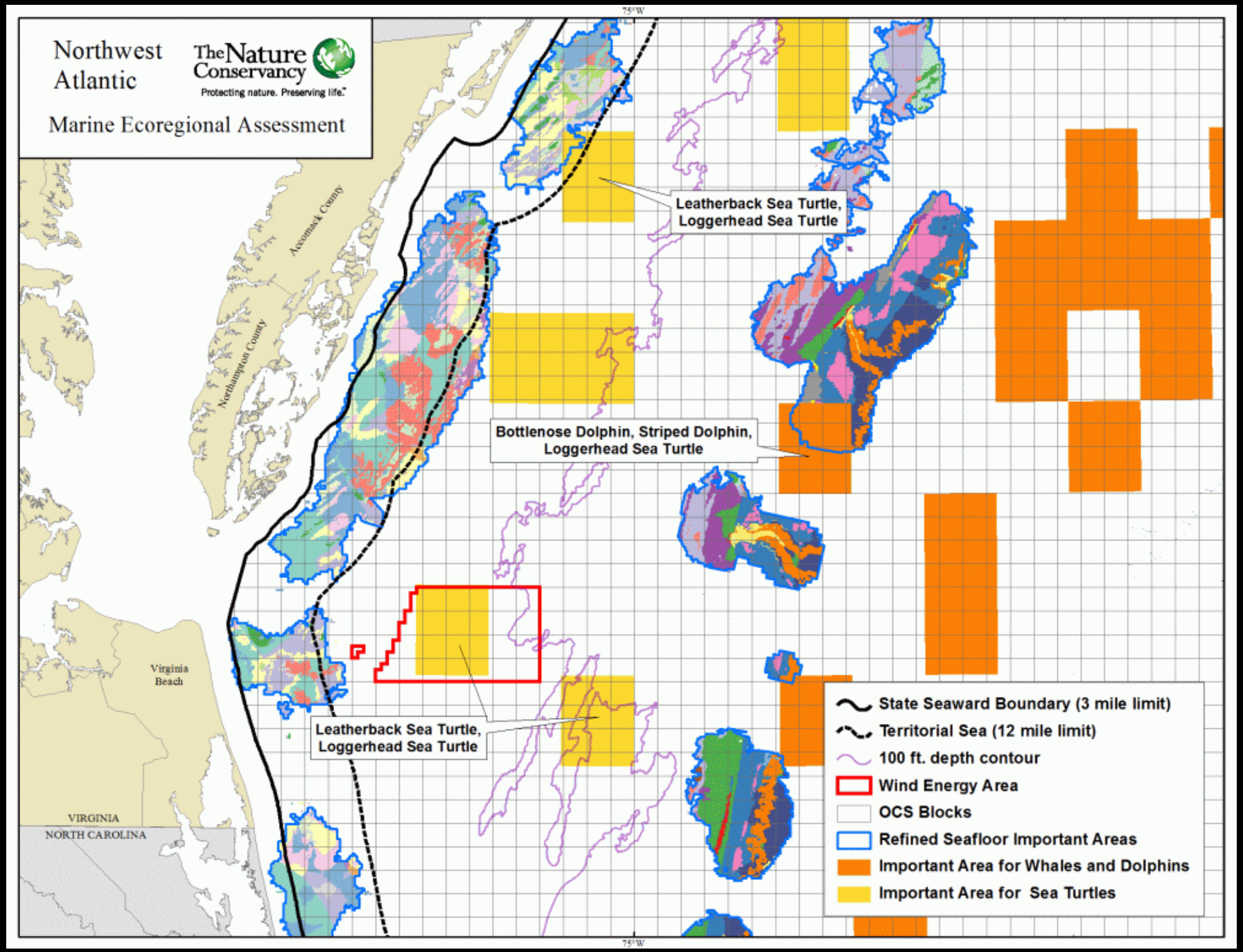

Northwest Atlantic
The Nature Conservancy
Protecting nature. Preserving life.
Marine Ecoregional Assessment
75°W
Accomack County
Northampton County
Virginia Beach
VIRGINIA
NORTH CAROLINA
Leatherback Sea Turtle, Loggerhead Sea Turtle
Bottlenose Dolphin, Striped Dolphin, Loggerhead Sea Turtle
Leatherback Sea Turtle, Loggerhead Sea Turtle
State Seaward Boundary (3 mile limit)
Territorial Sea (12 mile limit)
100 ft. depth contour
Wind Energy Area
OCS Blocks
Refined Seafloor Important Areas
Important Area for Whales and Dolphins
Important Area for Sea Turtles

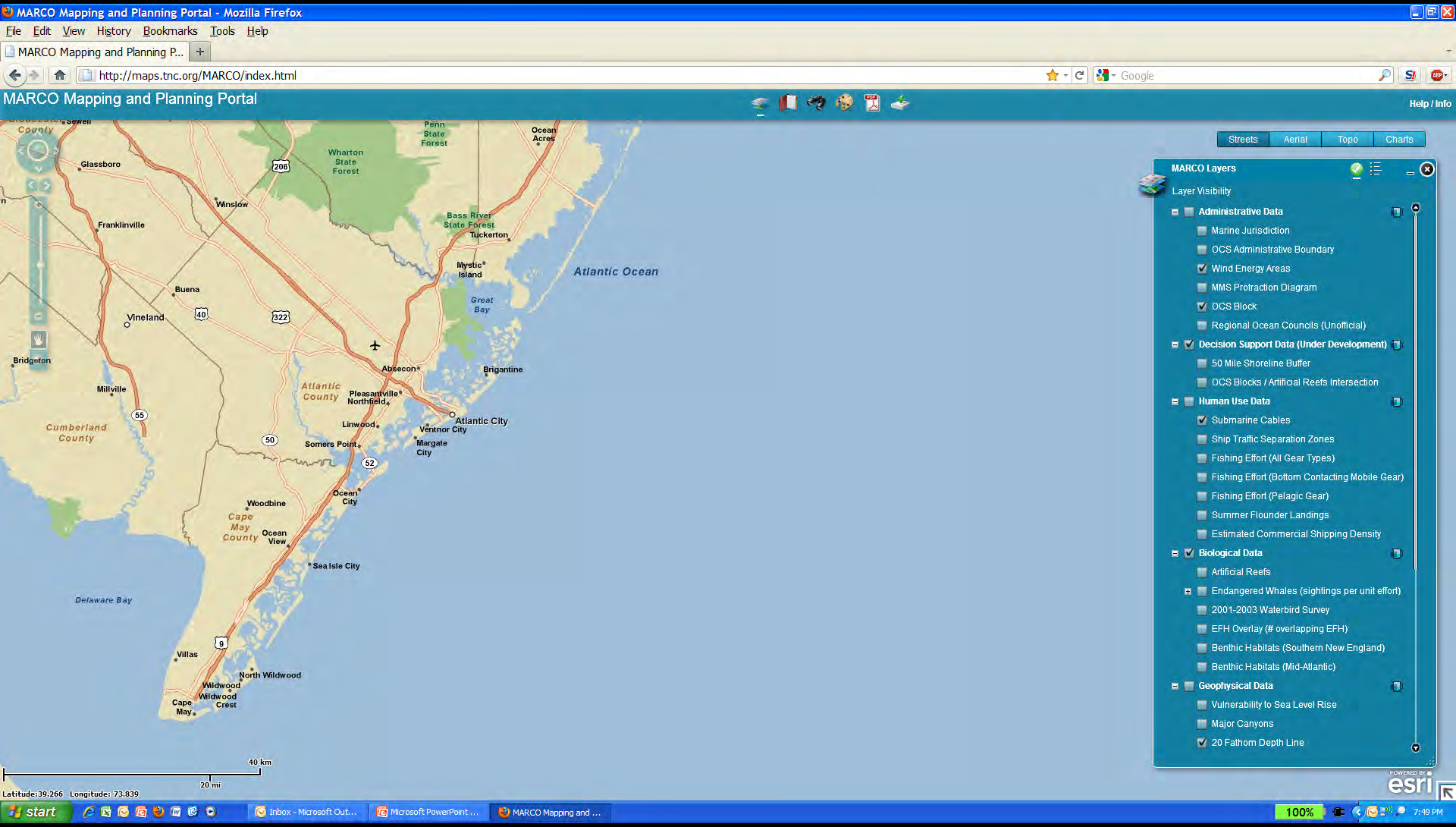
The CMSP Stakeholder Challenge

- CMSP requires engaging thousands of stakeholders to answer 3 basic questions*:
  - Where are we today?
  - Where do we want to be?
  - How are we going to get there?
- Technology can help but…
- The tools need to serve the people and the process

*Douvere & Ehler

Ideal CMSP Portal Attributes: Basic

- Provide access to best available relevant data that is trusted and/or understood by stakeholders
- Intuitive user interface – easy to drive
- Fast and stable
- Aesthetics are important too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Streets
Aerial
Topo
Charts
MARCO Layers
Layer Visibility
Administrative Data
Marine Jurisdiction
OCS Administrative Boundary
Wind Energy Areas
MMS Protraction Diagram
OCS Block
Regional Ocean Councils (Unofficial)
Decision Support Data (Under Development)
50 Mile Shoreline Buffer
OCS Blocks / Artificial Reefs Intersection
Human Use Data
Submarine Cables
Ship Traffic Separation Zones
Fishing Effort (All Gear Types)
Fishing Effort (Bottom Contacting Mobile Gear)
Fishing Effort (Pelagic Gear)
Summer Flounder Landings
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2001-2003 Waterbird Survey
EFH Overlay (# overlapping EFH)
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Benthic Habitats (Mid-Atlantic)
Geophysical Data
Vulnerability to Sea Level Rise
Major Canyons
20 Fathom Depth Line
Atlantic Ocean
Great Bay
Delaware Bay
Penn State Forest
Wharton State Forest
Bass River State Forest
Glassboro
Winslow
Franklinville
Buena
Vineland
Bridgeton
Millville
Cumberland County
Atlantic County
Cape May County
Ocean Acres
Tuckerton
Mystic Island
Absecon
Brigantine
Pleasantville
Northfield
Linwood
Atlantic City
Ventnor City
Margate City
Somers Point
Ocean City
Woodbine
Ocean View
Sea Isle City
Villas
North Wildwood
Wildwood
Wildwood Crest
Cape May
40 km
20 mi
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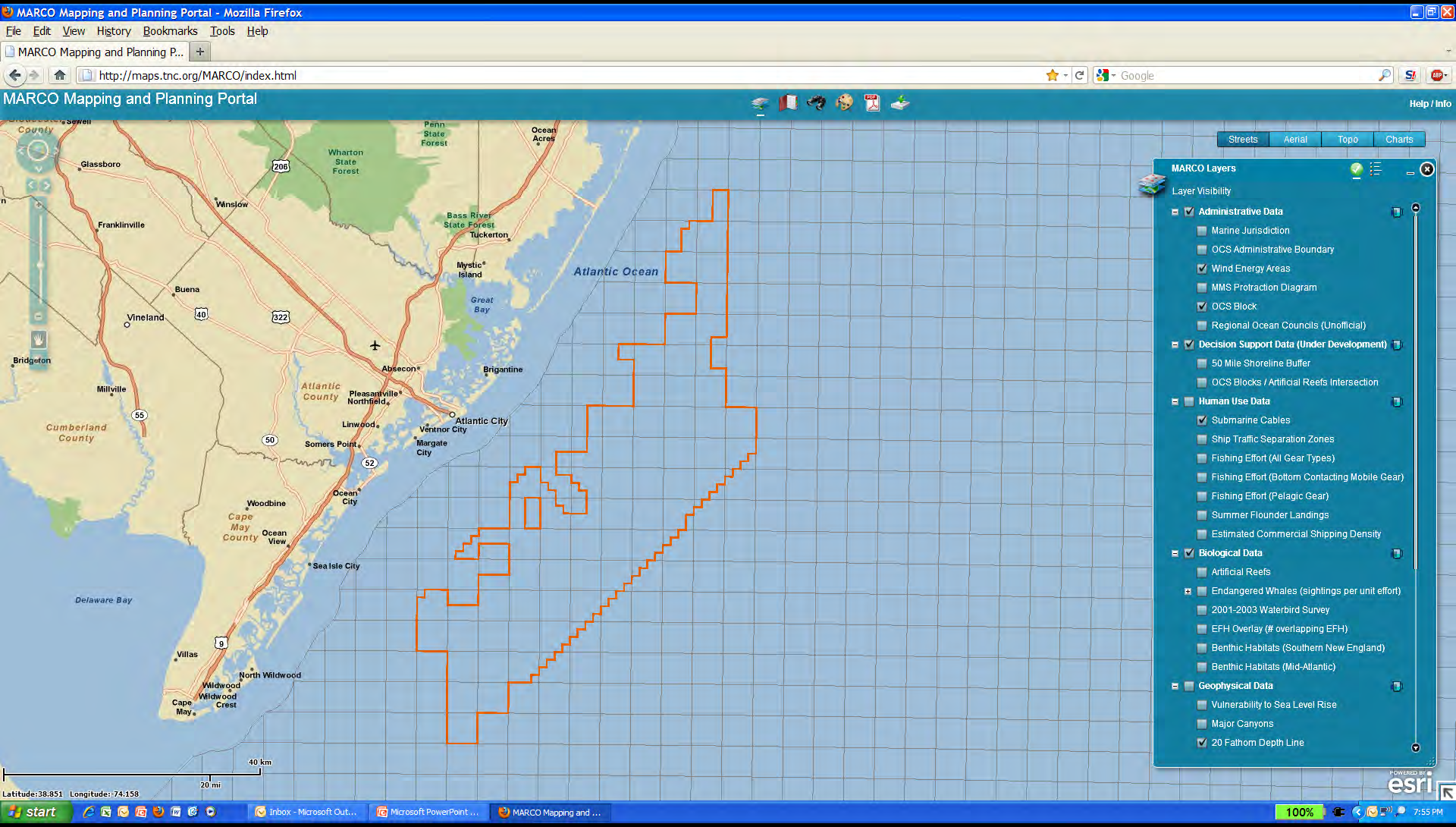
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Vineland
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Millville
Absecon
Brigantine
Atlantic City
Ventnor City
Margate City
Pleasantville
Northfield
Linwood
Somers Point
Atlantic County
Cumberland County
Cape May County
Woodbine
Ocean City
Ocean View
Sea Isle City
Delaware Bay
Villas
North Wildwood
Wildwood
Wildwood Crest
Cape May
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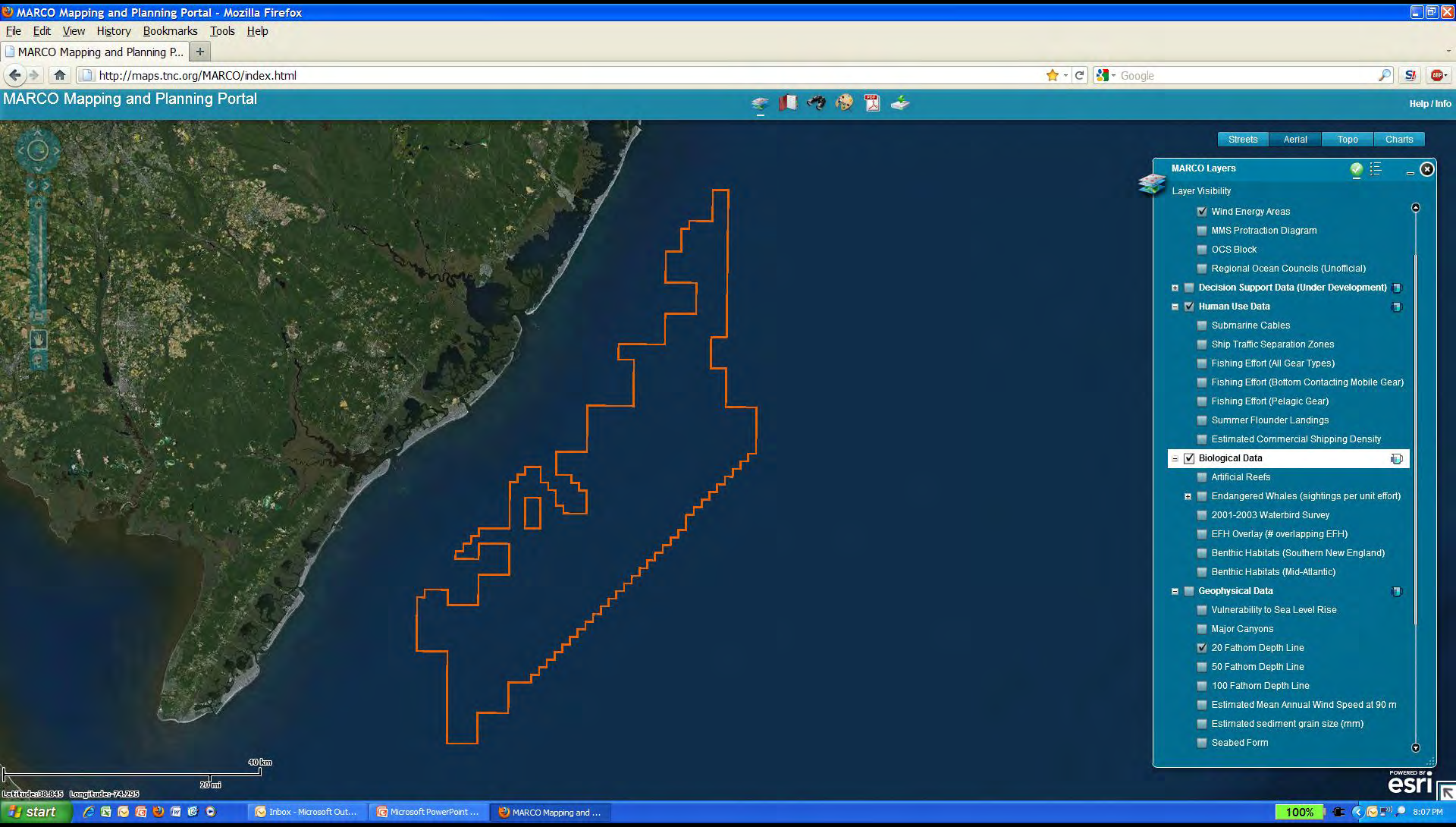
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50 Fathom Depth Line
100 Fathom Depth Line
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Estimated sediment grain size (mm)
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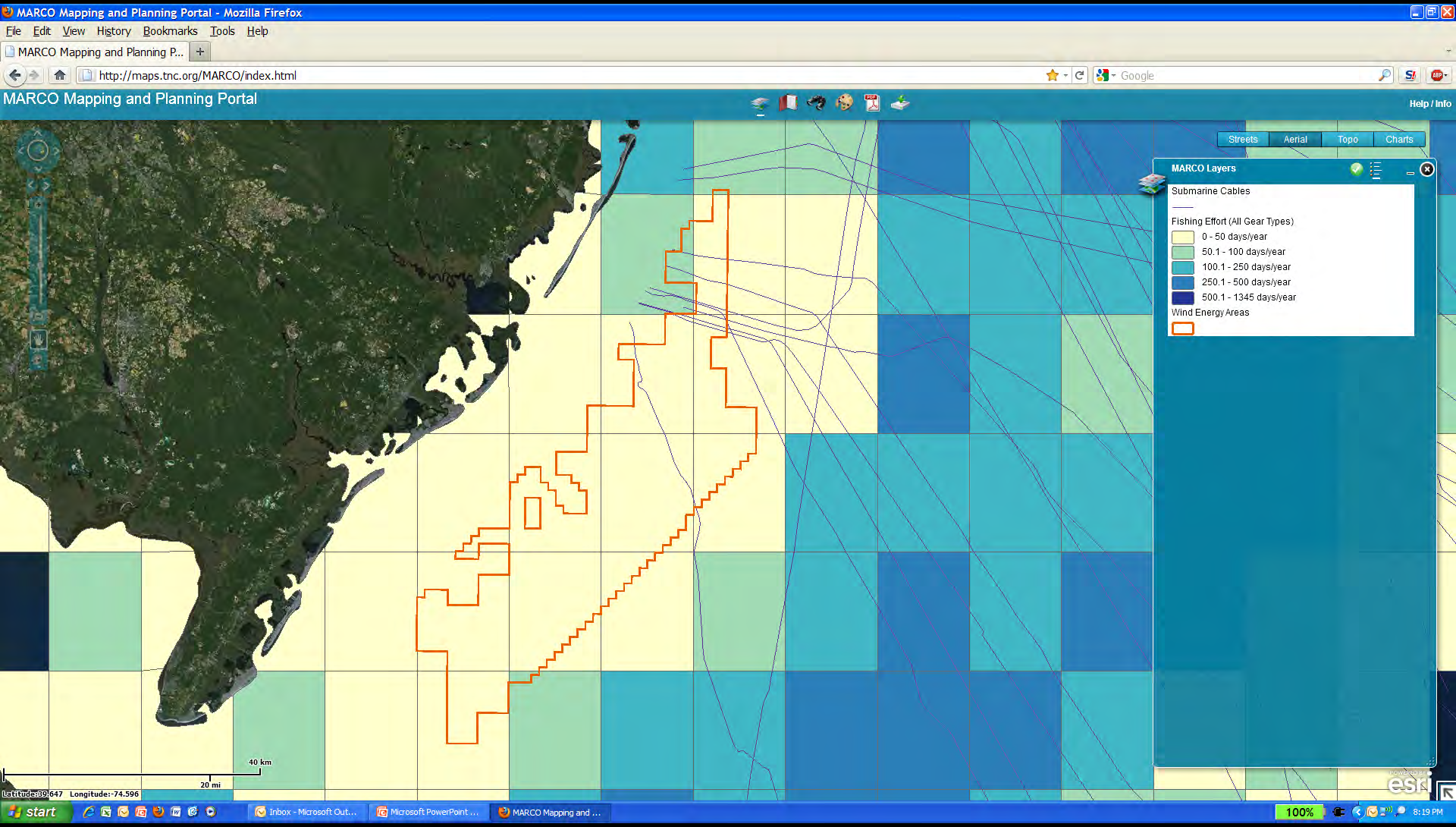
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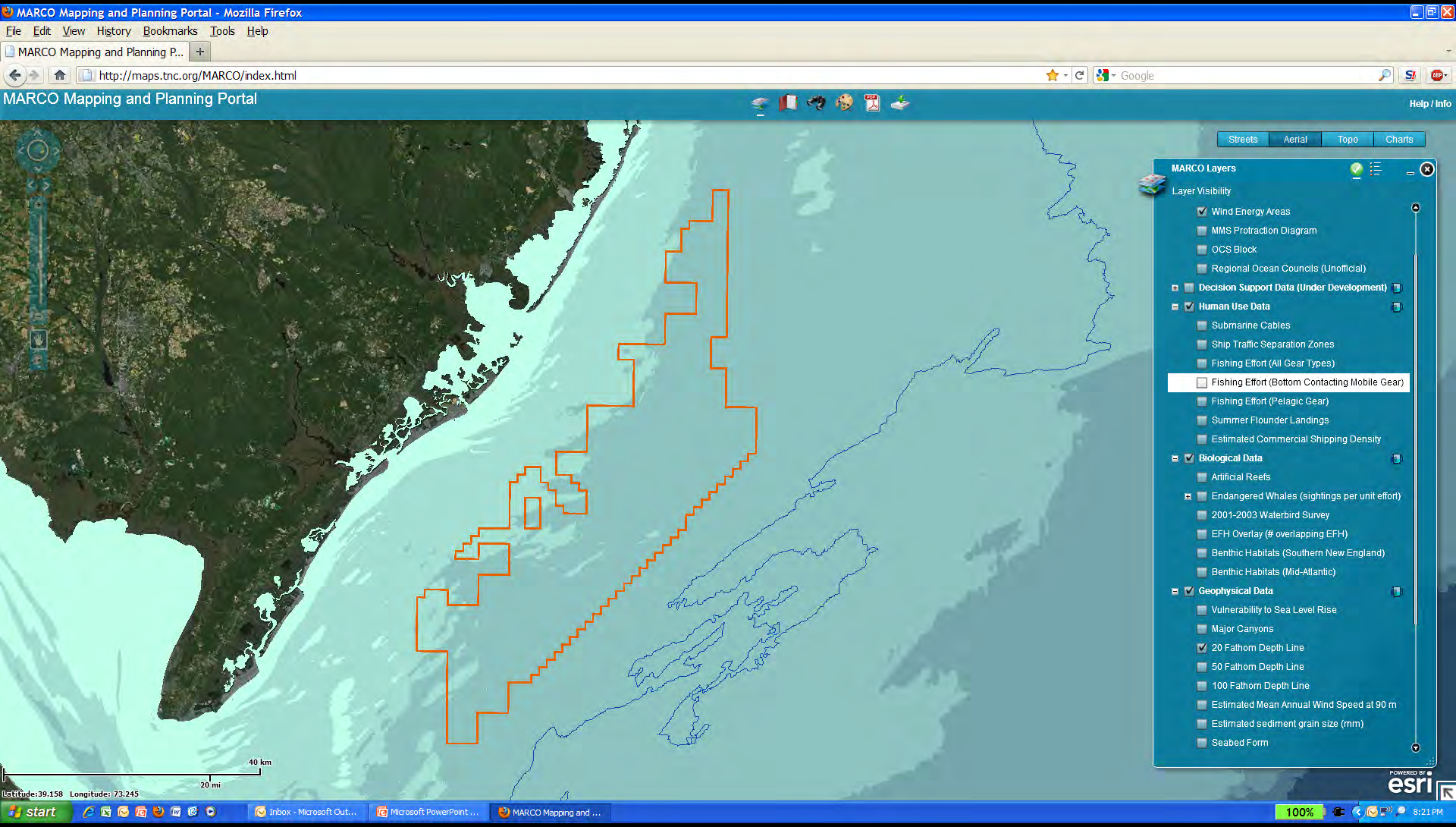
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100 Fathom Depth Line
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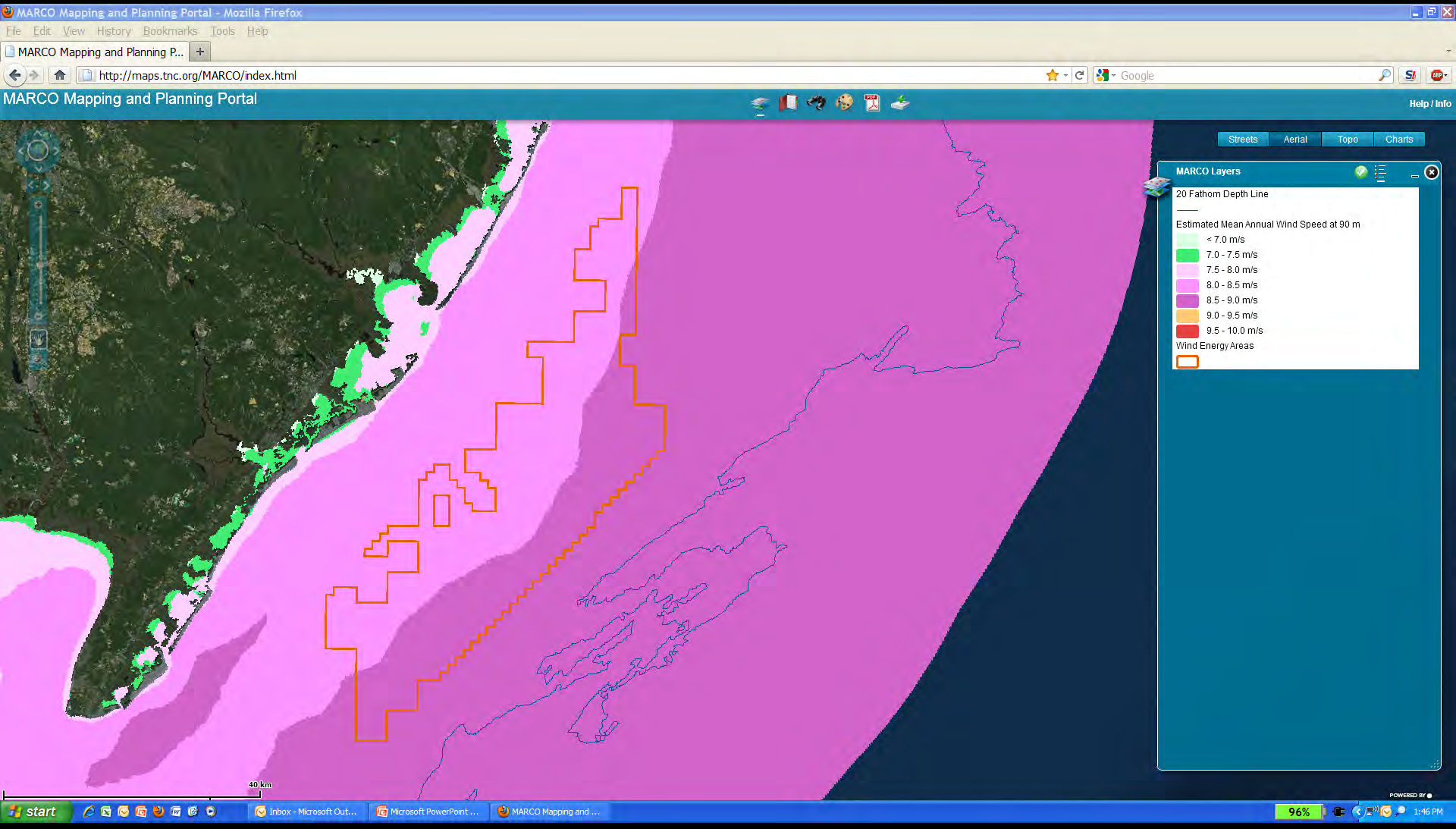
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< 7.0 m/s
7.0 - 7.5 m/s
7.5 - 8.0 m/s
8.0 - 8.5 m/s
8.5 - 9.0 m/s
9.0 - 9.5 m/s
9.5 - 10.0 m/s
Wind Energy Areas
40 km
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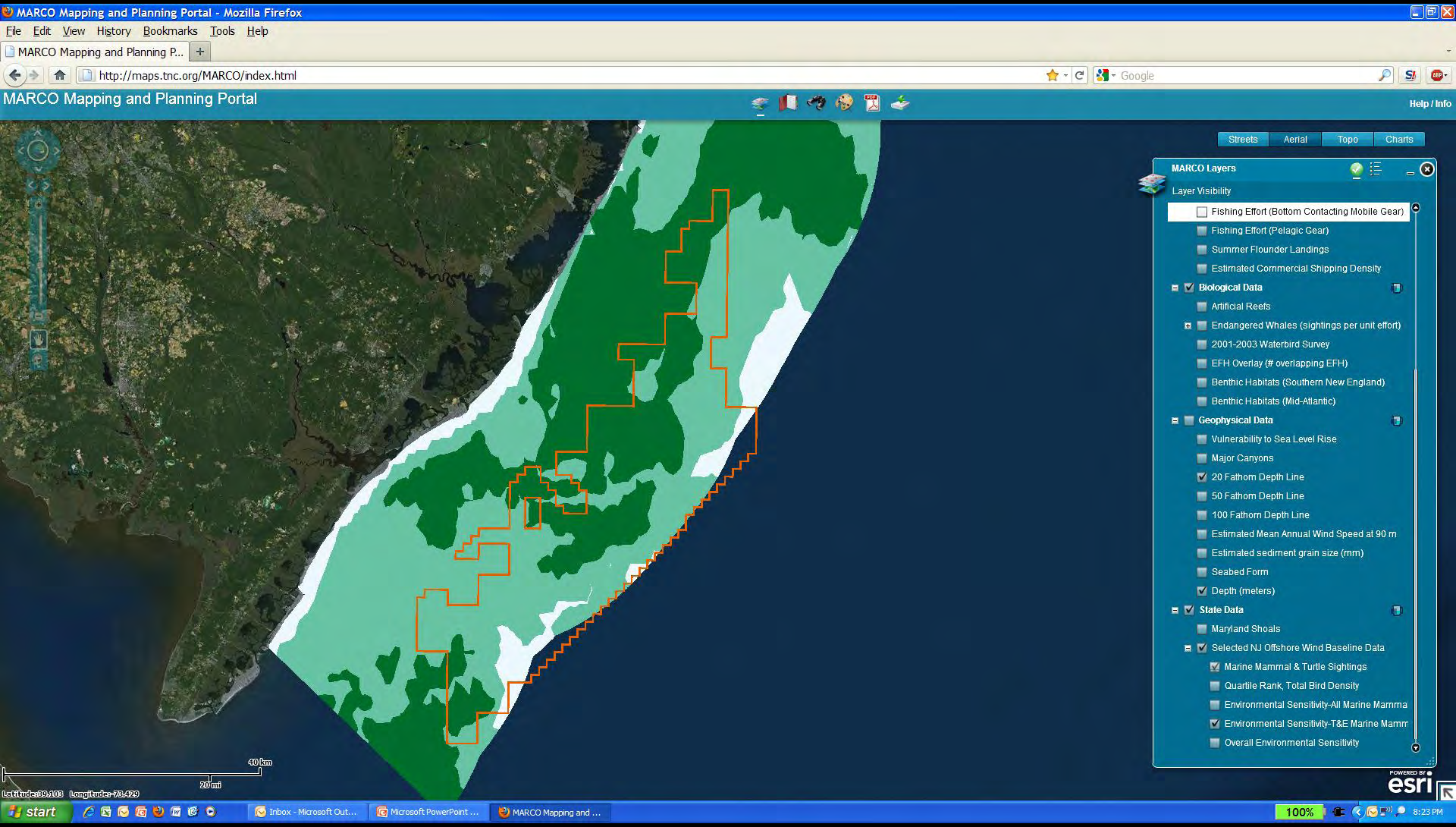
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Seabed Form
Depth (meters)
State Data
Maryland Shoals
Selected NJ Offshore Wind Baseline Data
Marine Mammal & Turtle Sightings
Quartile Rank, Total Bird Density
Environmental Sensitivity-All Marine Mamma
Environmental Sensitivity-T&E Marine Mamm
Overall Environmental Sensitivity
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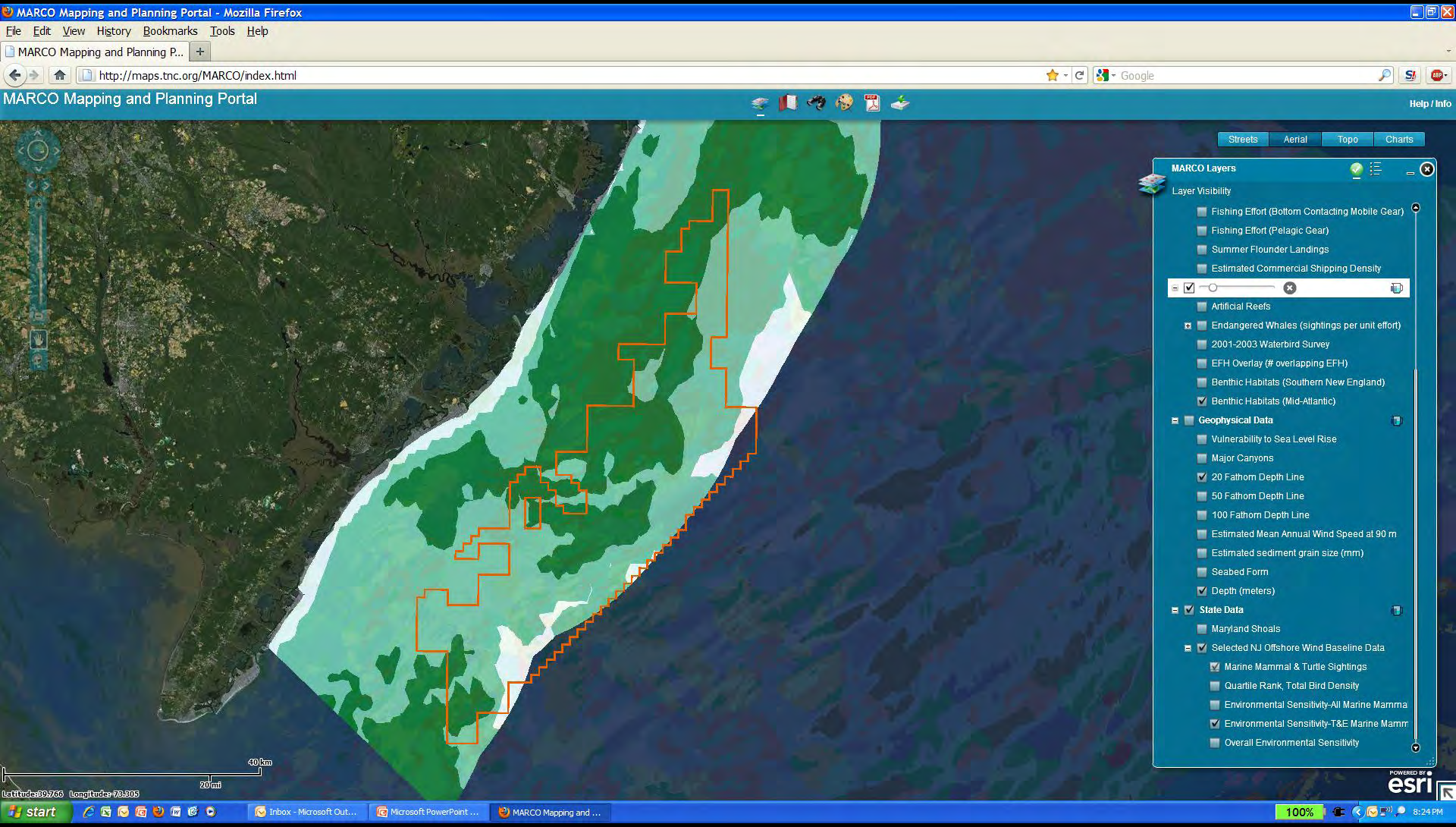
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Environmental Sensitivity-T&E Marine Mamm
Overall Environmental Sensitivity
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20 mi
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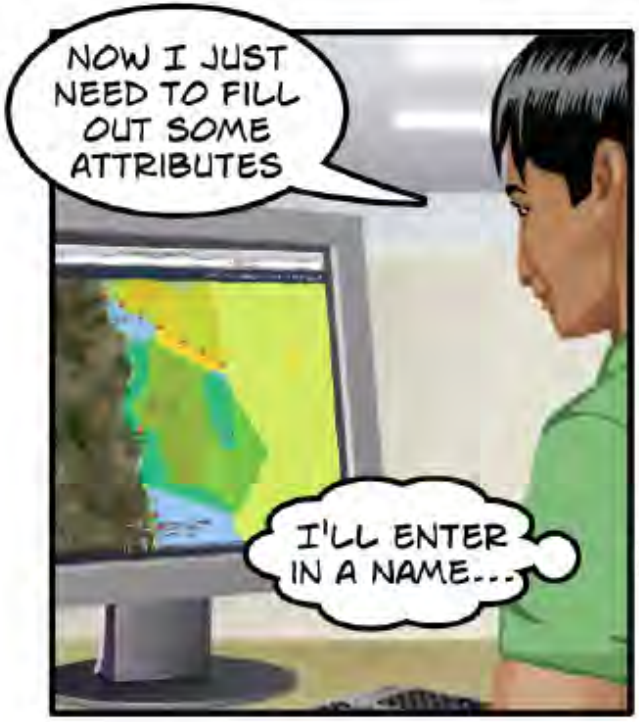
Ideal CMSP Portal Attributes: Advanced

- Create, save, share and refine spatial management scenarios
- Identify conflicts and compatibilities between different human uses, and between human uses and ecosystem features
- Evaluate how well scenarios meet diverse objectives
- Discover best-fit spatial management solutions



Site-Specific Rationale

In one or two sentences, please describe how this Wind Energy Site contributes to the Legislative Objectives of this process.

The northern boundary of this wind energy site has been designed to stop short of the Military Exclusion Zone.

...AND HERE'S A GOOD PLACE TO EXPLAIN MY INTENT TO AVOID THE MILITARY EXCLUSION ZONE

Submit

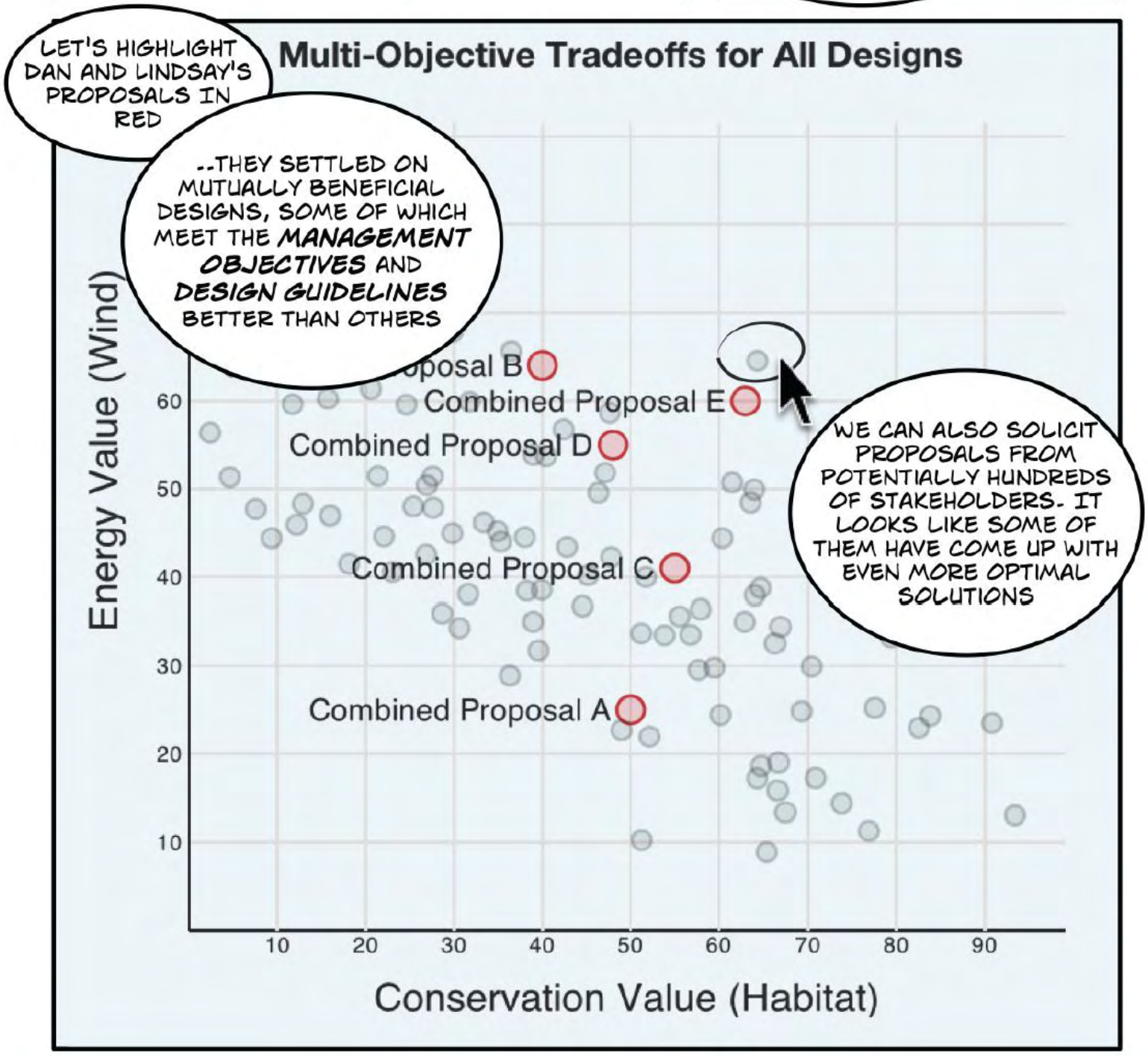
THE PROPOSAL IS ***SAVED*** TO THIS USER'S ACCOUNT AND A REPORT IS GENERATED *IN SECONDS* THAT RELATES IT TO ***MANAGEMENT OBJECTIVES*** AND ***DESIGN GUIDELINES***

LIGHTHOUSE POINT WIND FARM

LOOKS LIKE THERE IS MORE THAN ENOUGH WIND ENERGY HERE

ESTIMATED ENERGY PRODUCTION

1700 MEGAWATTS – THIS AREA IS PRODUCTIVE ENOUGH TO REPRESENT A GOOD INVESTMENT


LET'S HIGHLIGHT DAN AND LINDSAY'S PROPOSALS IN RED
--THEY SETTLED ON MUTUALLY BENEFICIAL DESIGNS, SOME OF WHICH MEET THE MANAGEMENT OBJECTIVES AND DESIGN GUIDELINES BETTER THAN OTHERS
WE CAN ALSO SOLICIT PROPOSALS FROM POTENTIALLY HUNDREDS OF STAKEHOLDERS. IT LOOKS LIKE SOME OF THEM HAVE COME UP WITH EVEN MORE OPTIMAL SOLUTIONS
Multi-Objective Tradeoffs for All Designs
Combined Proposal E
Combined Proposal D
Combined Proposal C
Combined Proposal A
Energy Value (Wind)
Conservation Value (Habitat)
10
20
30
40
50
60
70
80
90

Current Uses & Next Steps for NAM ERA

- Wind energy siting decisions
- Multipurpose Marine Cadastre
- MARCO & NROC Data Portals
- Informing our fishery policy engagement (e.g. EFH Omnibus Amendment by NEFMC/MAFMC)
- Next steps:
  - Cumulative impacts and sensitivity layers
  - Extending the benthic model to the estuaries (DE Bay, LIS, Chesapeake Bay)

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