

MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

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
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Christopher M. Moore, Ph.D.
Executive Director

MEMORANDUM

DATE: March 28, 2012

TO: Ecosystems and Ocean Planning Committee (deFur, McMurray, Berg, Elliott, Linhard, Luisi, Miko, Munden, Schafer, Travelstead, and Zeman) and Pugliese and Bachman

FROM: Tom Hoff 

SUBJECT: April Council meeting

The Ecosystems and Ocean Planning Committee will meet on Tuesday April 10 from 3:00 to 5:00 PM at the Duck, NC Council meeting. There will be two presentations.

First, Roger Pugliese, long-term ecosystem and habitat staffer, will present on deep-sea coral (DSC) activities of the South Atlantic Fishery Management Council. His PowerPoint presentation is attached.

Second, Michelle Bachman, habitat coordinator, will present on DSC activities of the New England Fishery Management Council. Her PowerPoint presentation is also attached. Additionally, please find her summary minutes from the February 23, 2012 New England Habitat Oversight Committee meeting (Dr. deFur is a member) and the March 7, 2012 Habitat PDT Committee meeting (I am a member). Michelle will also discuss the April Habitat Oversight Committee meeting during her presentation.

I look forward to seeing everyone in Duck.



Crafting Conservation for Deepwater Ecosystems of the South Atlantic Region

Ecosystem and Ocean Planning Committee Meeting
Mid-Atlantic Fishery Management Council

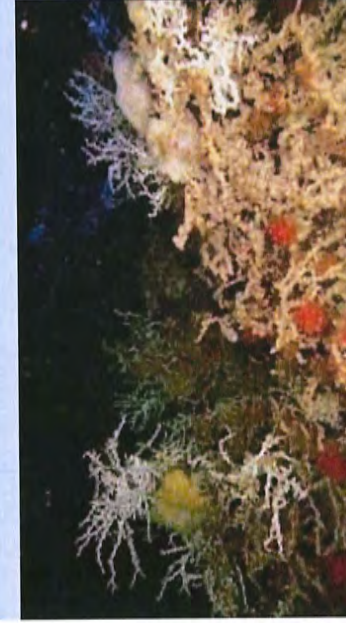
Sanderling Inn, Duck, North Carolina
April 10, 2012

Roger Pugliese
South Atlantic Fishery Management Council



Overview

- South Atlantic Ecosystem
- From Concept to Regulation
- Coral FMP and Coral Habitat Areas of Particular Concerns
- Habitat and Coral Advisory Panels
- Supporting Research, Development of Research Plan and Information Transfer
- Fishing Industry, Shrimp and Golden Crab Advisory Panels
- Supporting Spatial and Online Tools
- Ecosystem Based Management: FEP and CEBA 1
- Ongoing and Future Activities in the South Atlantic



South Atlantic Ecosystem: Oceanography

Characteristics of the South Atlantic

Range of shelf widths

Along shelf break --
major boundary current

Loop Current

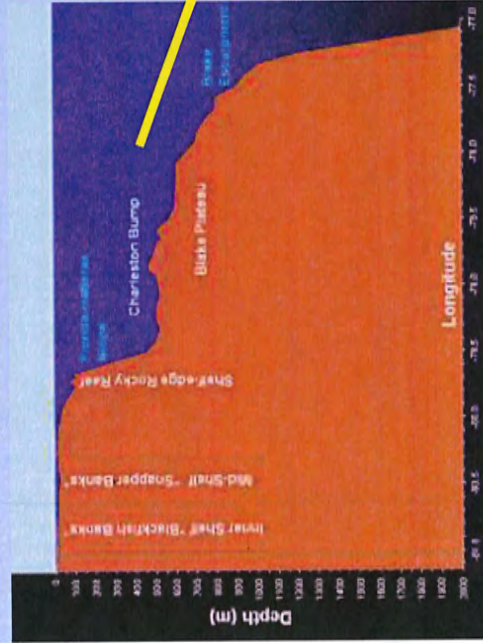
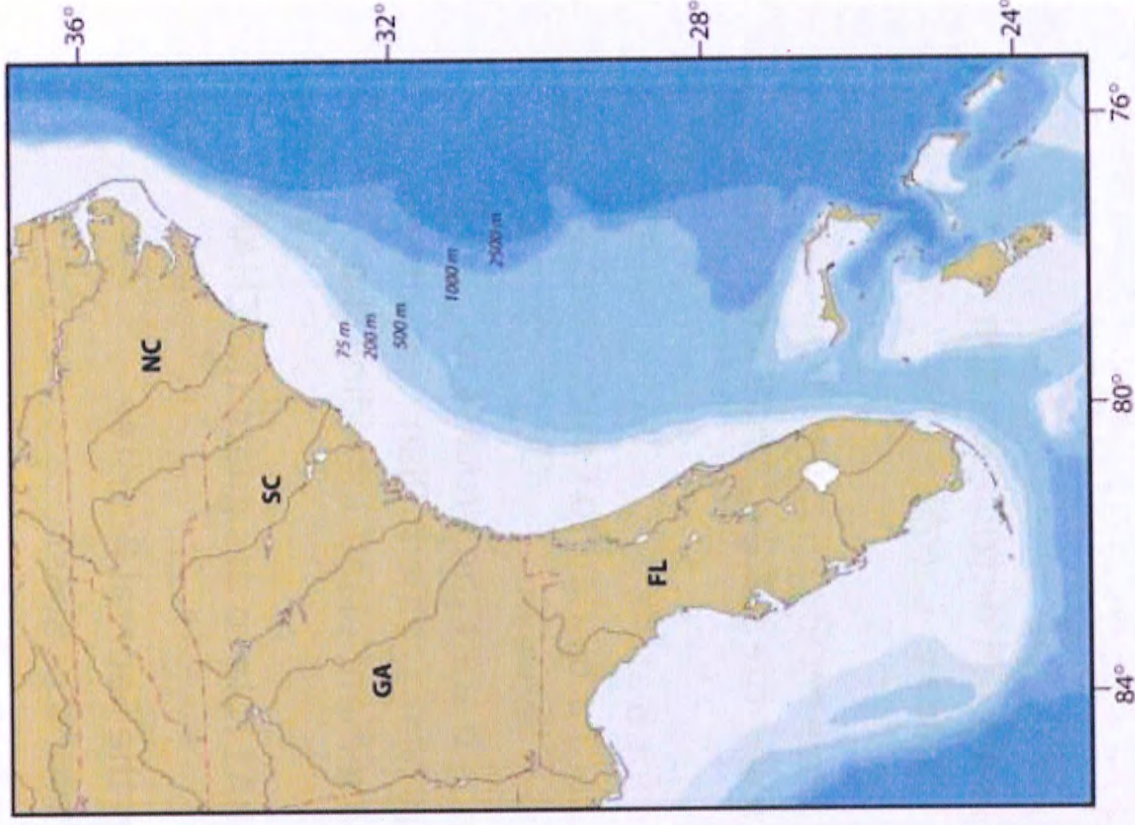
Florida Current

Gulf Stream

Freshwater input –

*Distributed input from a number of rivers,
river drainage basins primarily in these
coastal states*

Biogeographically –
temperate to sub-tropical transition zone



Timeline from Concept to Regulation

- **2003** Council funds development of detailed reports on distribution and characterization of deepwater coral habitat off 1)North Carolina and 2) off South Carolina, Georgia and East of Florida.
- **Oct 2004** SAFMC Coral and Habitat Advisory Panels receive reports from deepwater scientists (Reed and Ross) summarizing the state of knowledge on deepwater reefs in the region
- **Oct 2004** APs recommend CHAPC designations for 6 areas
- **June 2006** Updated characterization report (Reed) provided to Council and based on new information CHAPC boundaries are redrawn
- **June 2006** SAFMC adopts AP recommendation and start the process to implement through amending the Coral Fishery Management Plan
- **CE-BA1** drafted to amend several fishery management plans, including the Coral Fishery Management Plan
- **March 4 2010** Notice of Availability of the CE-BA1 rule to designate the CHAPC published in the Federal Register
- **March 26, 2010** Proposed CE-BA1 published in the Federal Register
- **June 22, 2010** Final CE-BA1 published in the Federal Register
- **July 22, 2010** Coral HAPC goes into effect

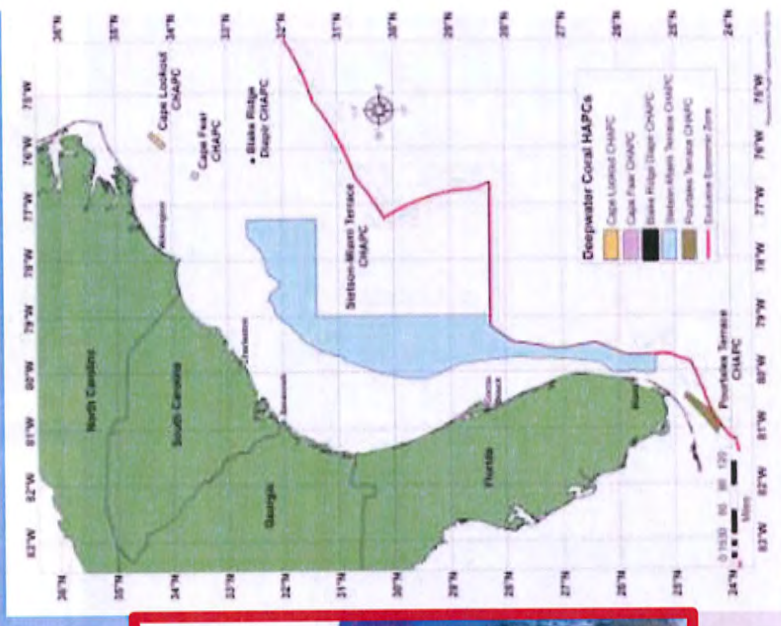
Development of Coral Habitat Areas of Particular Concern (C-HAPCs)

- The Coral, Coral Reef and Live Hard Bottom Habitat FMP provided the regulatory mechanism to establish Coral Habitat Areas of Particular Concern



Chapman's Reef: Oculina HAPC

Credit: Amanda Maness 2006



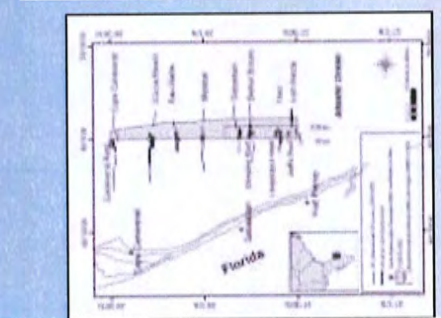
Reed et al. (2007)

CEBA-1, 2009)

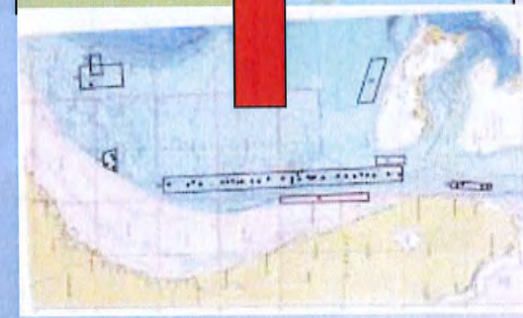
Progression to Comprehensive Ecosystem-Based Management Supporting Deepwater Coral Systems

1980...1998.....2004.....2007.....2009
 Place-based/species specific - - - Integrated Multi-species Mgmt - - - Ecosystem Base Mgmt (MSP)

Oculina Bank
Coral HAPC



Reed et al. (2004)

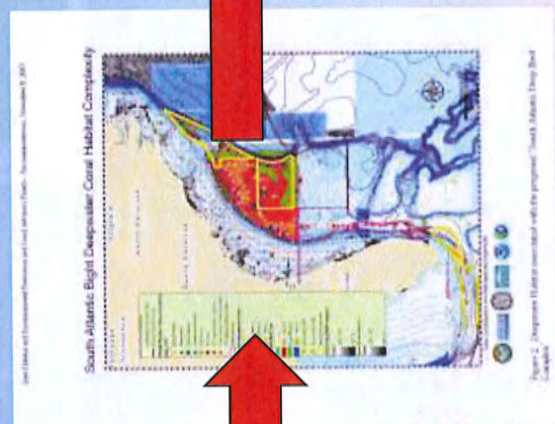


Reed et al. (2004)

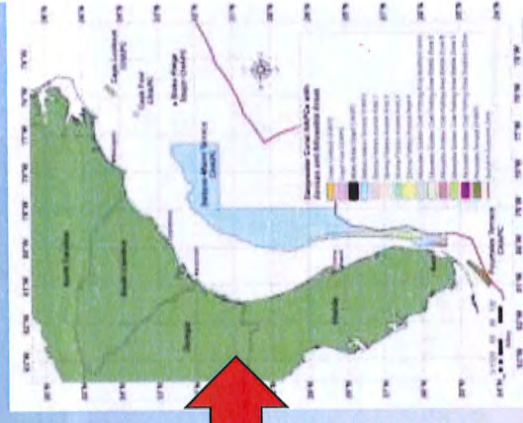
Deepwater Coral HAPCs



From SAFMC (2004)



From SAFMC (2007)



From SAFMC (2010)

The Foundation of Deepwater CHAPC Development

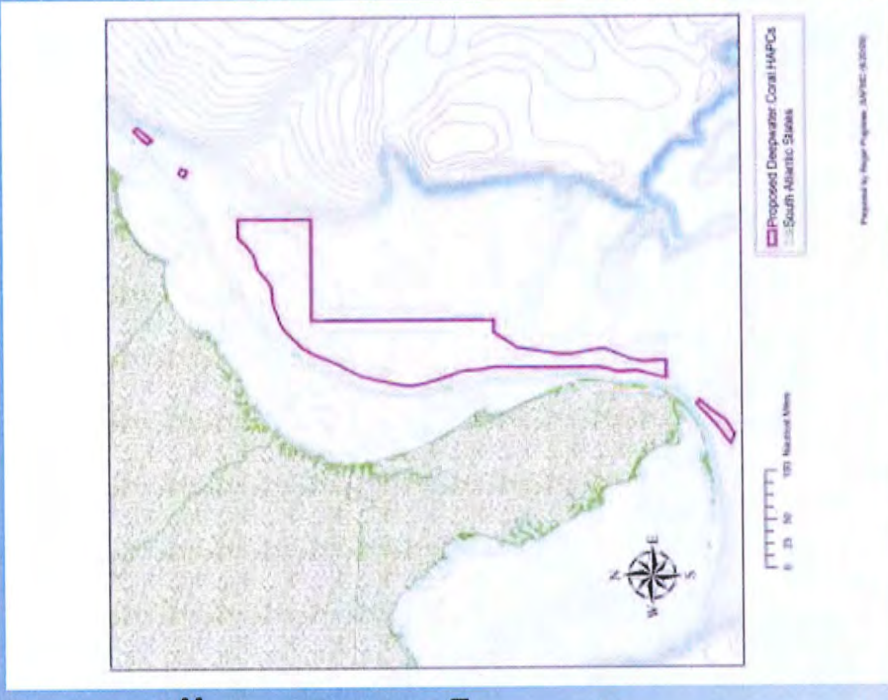
- 2003 - Council contracts deepwater coral researchers to compile personal research into two reports documenting distribution and characterization of deepwater coral reefs 1) off South Carolina, Georgia and the East Coast of Florida and 2) off North Carolina.
- Council develops in-house and online GIS capabilities to support habitat, ecosystem and deepwater coral information.
- Habitat Advisory Panel and Restructured Coral Advisory Panel meets October 26-28, 2004
 - Presentations on reports and deepwater research:
 - 1) DEEP-WATER CORAL REEFS OF FLORIDA, GEORGIA AND SOUTH CAROLINA: A SUMMARY OF THE DISTRIBUTION, HABITAT, AND ASSOCIATED FAUNA (John Reed, 2004); and
 - 2) GENERAL DESCRIPTION OF DISTRIBUTION, HABITAT, AND ASSOCIATED FAUNA OF DEEP WATER CORAL REEFS ON THE NORTH CAROLINA CONTINENTAL SLOPE (Jeff Ross, 2004).
 - Deepwater coral HAPCs integrated into the Fishery Ecosystem Plan and Comprehensive Ecosystem Amendment development process.
 - AP recommendations on the establishment of new deepwater coral HAPCs in the South Atlantic.
 - Overview of the draft deepwater coral research and monitoring plan.

The Habitat and Coral Advisory Panels met June 7-9, 2006

- Updated reports on deepwater coral habitat distribution and characterization in the South Atlantic Region were presented and used to formulate modifications to the proposed deepwater Coral HAPCs.

Recommendations for the Proposed Deepwater Coral HAPCs:

- Expanded based on new research and data compiled for the Council and presented to the Advisory Panels
- Combine the large CHAPC into the Stetson-Miami Terrace CHAPC with to include newly documented sites to the north, enlarged the west to include the 400 meter isobath as the western boundary, expanded to the edge of the EEZ to the east. The western boundary along the Miami Terrace should be the 300 meter isobath to include newly documented deep coral habitat.
- Expand the Portales Terrace C-HAPC to cover newly documented deepwater coral habitat.
- **Regulations in proposed deepwater Coral HAPCs:**
prohibit all bottom-disturbing activities, prohibit harvest of all corals and prohibit any type of anchoring



Supporting Research: Addressing Data/Information Gaps and Needs: Deepwater Coral Research and Monitoring Plan

GOAL: To protect deepwater corals by:

- A. Refining existing (proposed) and designating new deepwater Coral HAPCs.
- B. Increasing our understanding of DWCEs' ecological role and function in the South Atlantic region to guide future management actions.

Implementation:

Phase I: Map and describe known and expected deepwater coral ecosystems in the South Atlantic region.

Phase II: Determine the ecological role of deepwater coral ecosystems in the South Atlantic region, especially the role of deepwater coral habitats as Essential Fish Habitat, and expand the understanding of structure-forming species' biology and ecology.



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George Geiger, Chairman
Dorise Hixon, Vice-Chairman

Robert K. Mahood, Executive Director
Gregg Wright, Deputy Executive Director

FINAL

Deepwater Coral Research and Monitoring Plan for the South Atlantic Region

March 2007

Background and Need to Support Management

The SAFLMC manages coral, coral reefs and live/hard bottom habitat, including deepwater corals, through the South Atlantic Coral Fishery Management Plan. Mechanisms exist in the FMP as amended to further protect deepwater coral and live/hard bottom habitats. The SAFLMC Habitat and Environmental Protection Advisory Panel and Coral Advisory Panel have supported proactive efforts to identify and protect deepwater coral ecosystems in the South Atlantic region. The Council has endorsed the Panel's recommendation for designation of new deepwater Coral Habitat Areas of Particular Concern under the Federal Coral FMP. New deepwater coral HAPCs will be designated through the Fishery Ecosystem Plan Comprehensive Amendment.

SCOPE

The Deepwater Coral Research and Monitoring Plan for the South Atlantic Region constitutes the regional research component of the implementation plan that will be a part of the NOAA Deep-Sea Coral and Sponge Conservation and Management Strategy. The purpose of the plan is to guide deepwater coral ecosystem research and monitoring efforts conducted by NOAA and partners through grants and contracts in the South Atlantic region. Additional components will address needs to expand partnerships, identify funding needs and implement deliverables.

In developing this plan, the South Atlantic Fishery Management Council is responding to recent amendments to the Magnuson-Stevens Act and NOAA's determination that an agency strategy is needed to effectively and efficiently address deepwater coral ecosystem issues. The primary goal of this Research and Monitoring Plan is to support conservation and management of deepwater coral ecosystems in the South Atlantic region while addressing NOAA's strategy to balance long-term uses of the marine ecosystem with maintenance of biodiversity. The Plan will also assist in meeting the new mandates of the Magnuson-Stevens Act.



Supporting Research and Use of Enhanced Technology SAFMC Multi-beam Mapping Cruise – 07



- Miami Terrace- Miocene-age terrace off southeastern Florida has high-relief, hard-bottom habitats and rich benthic communities
- Depths range from 300-600 m
- Found south of Boca Raton to southern Biscayne Bay

- Used multi-beam system aboard the Nancy Foster and Eagle Ray AUV to collect acoustic and backscatter data for preparation of maps of deepwater coral habitats in Proposed Deepwater CHAPCs; high-resolution multibeam in Miami Terrace – habitat for Golden Crab, Wreckfish, Barrelfish and Deep Coral spp.; 200 linear km of mapping through deep coral “hot spots” in proposed CHAPCs;



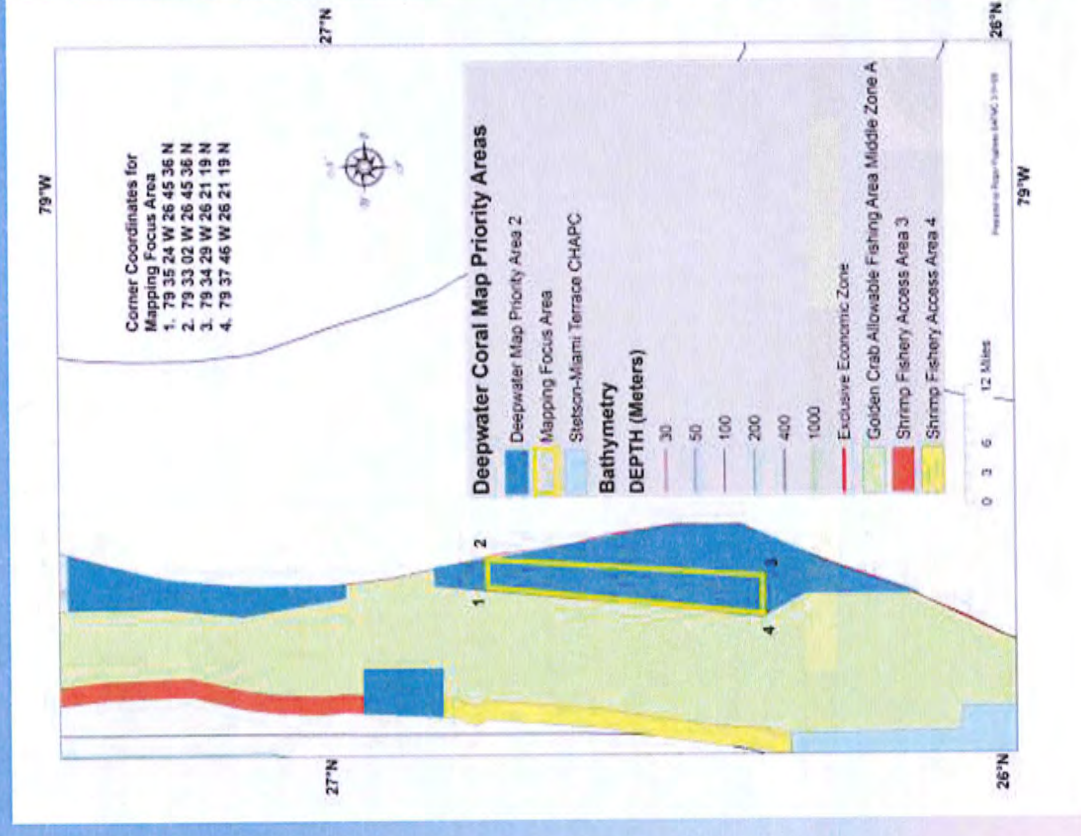
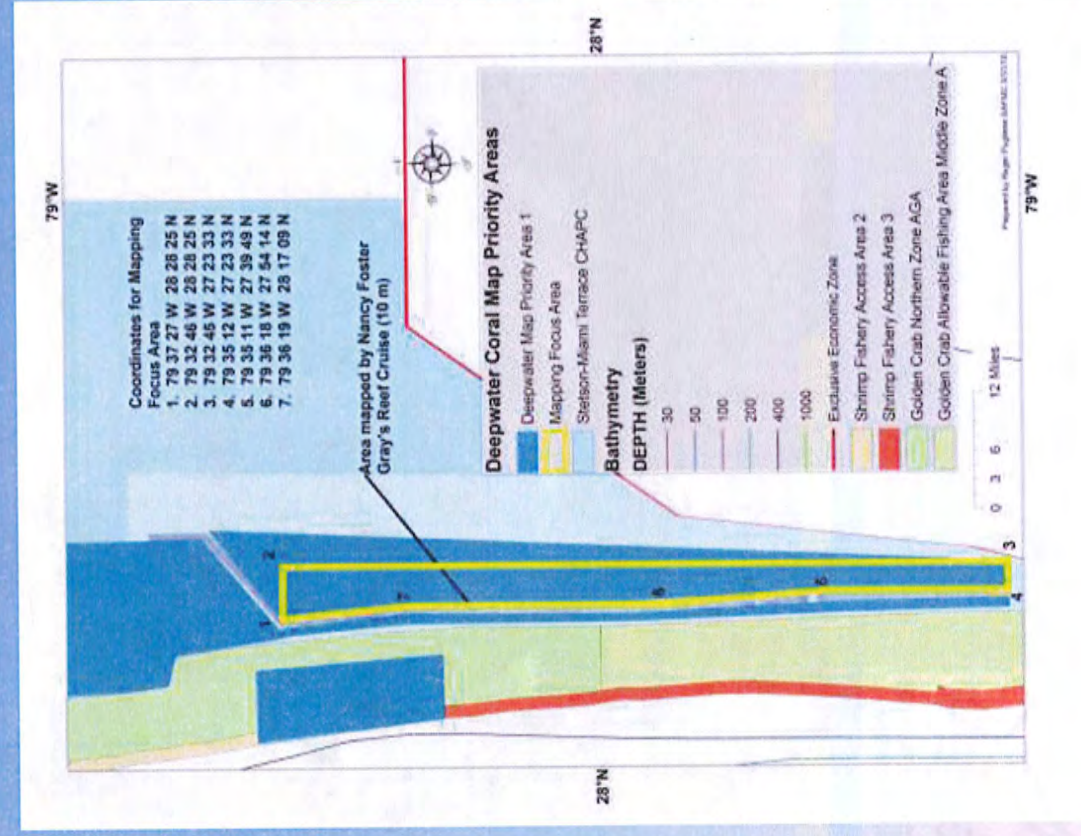
Partners



- SAFMC
- NURC/UNCW
- NIUST
- HBOI
- NOS Hydro
- NMFS
- FWRI
- College of Charleston
- SCDNR
- NOAA Ship Nancy Foster
- NMSP

Prioritizing Deepwater Coral Mapping Needs:

- Provide greater understanding of distribution and spatial extent of DWC
- Priority areas identified in areas of potential conflicts (multiple use)



Deepwater Coral Ecosystem Information Transfer: Development of Revealing the Deep Video

- “Revealing The Deep” Premier at SC Aquarium Charleston, SC November 6, 2007
- “Revealing the Deep” wins National Telly Award for Nature and Wildlife



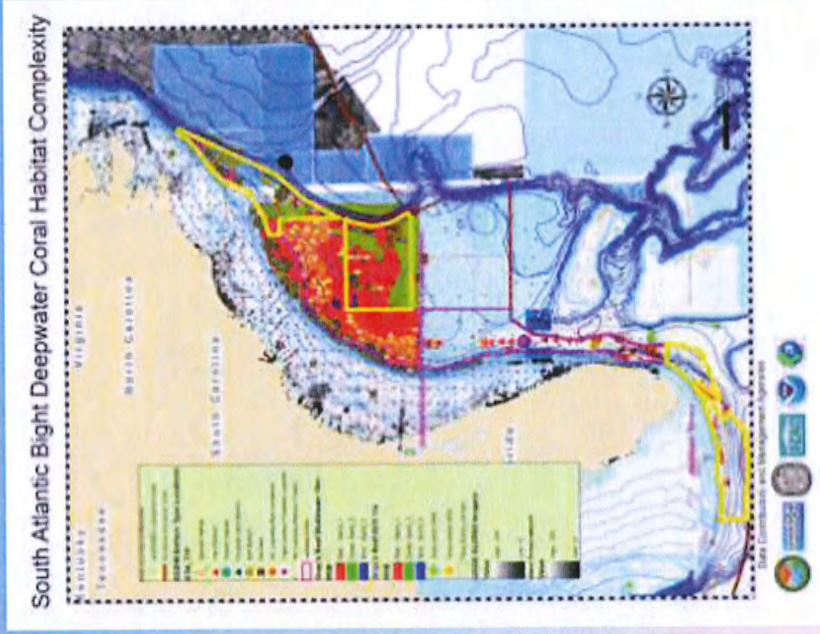
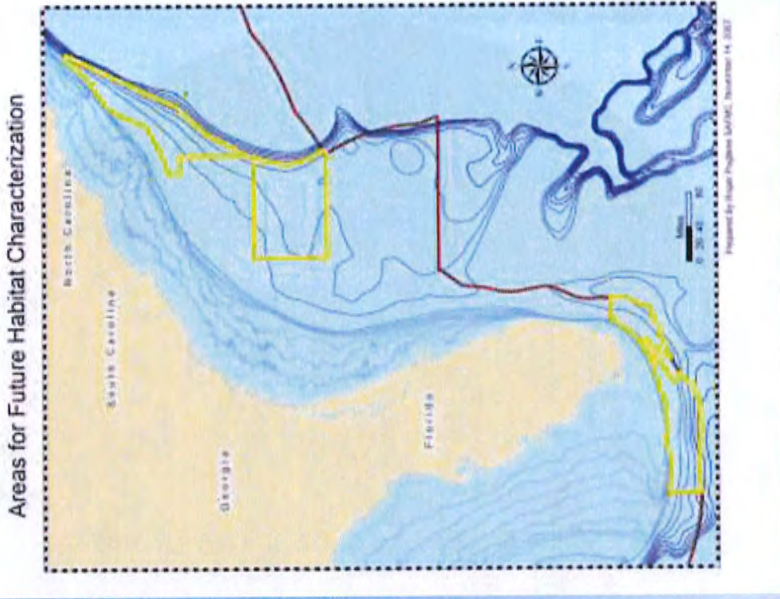
JOINT MEETING OF THE HABITAT AND ENVIRONMENTAL PROTECTION ADVISORY PANEL AND CORAL ADVISORY PANEL

(November 7-8, 2007)

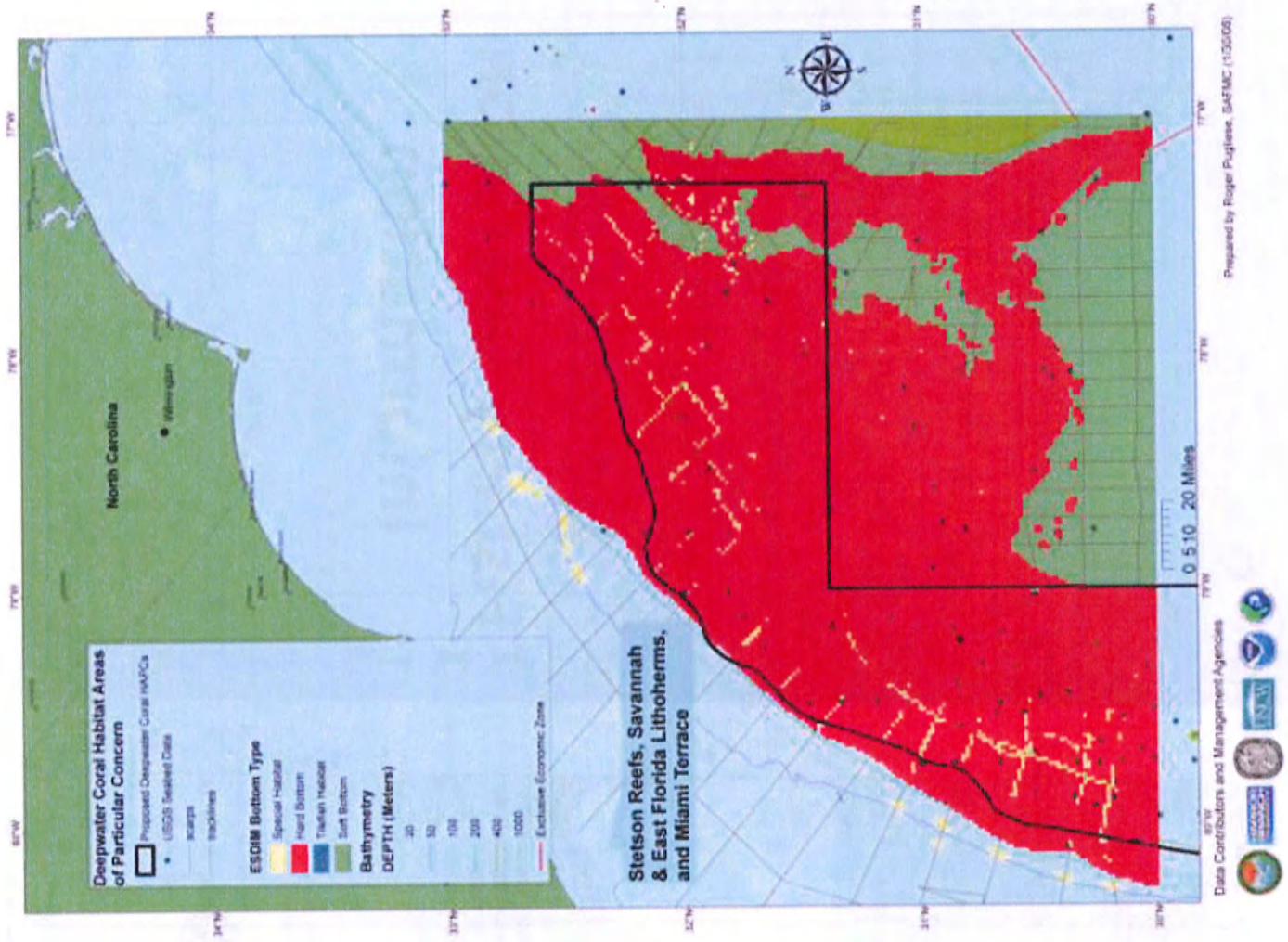
The Charleston Marriott Hotel

170 Lockwood Boulevard, Charleston, SC 29403

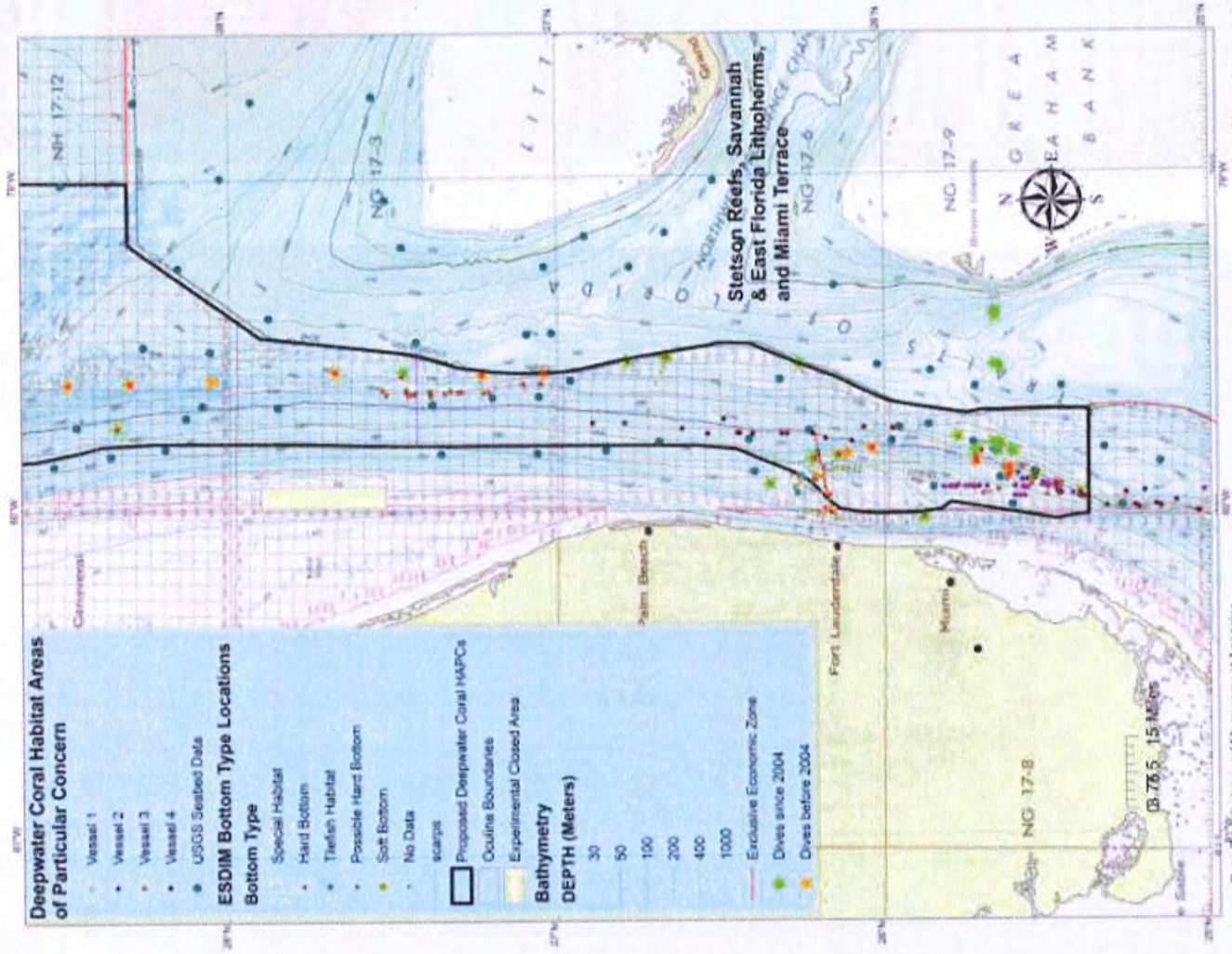
JOINT HABITAT AND CORAL AP FINDINGS AND RECOMMENDATIONS



Tailoring the Northwest Boundary of the Stetson-Miami Terrace CHAPC



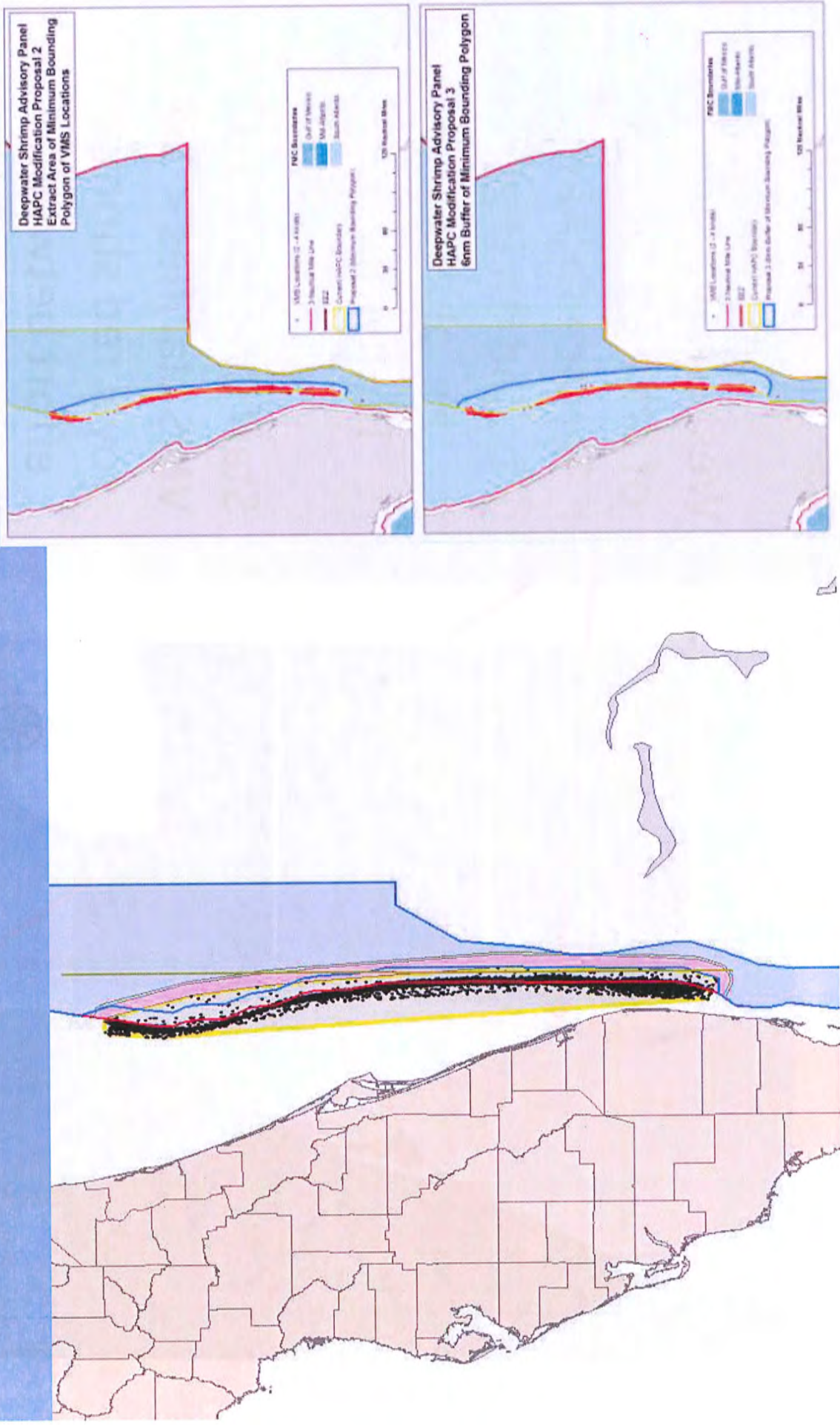
Merging Habitat Distribution and Industry Provided Golden Crab Fishery Operation Information



Prepared by Roger Pugliese, SAFMC (2/11/08)

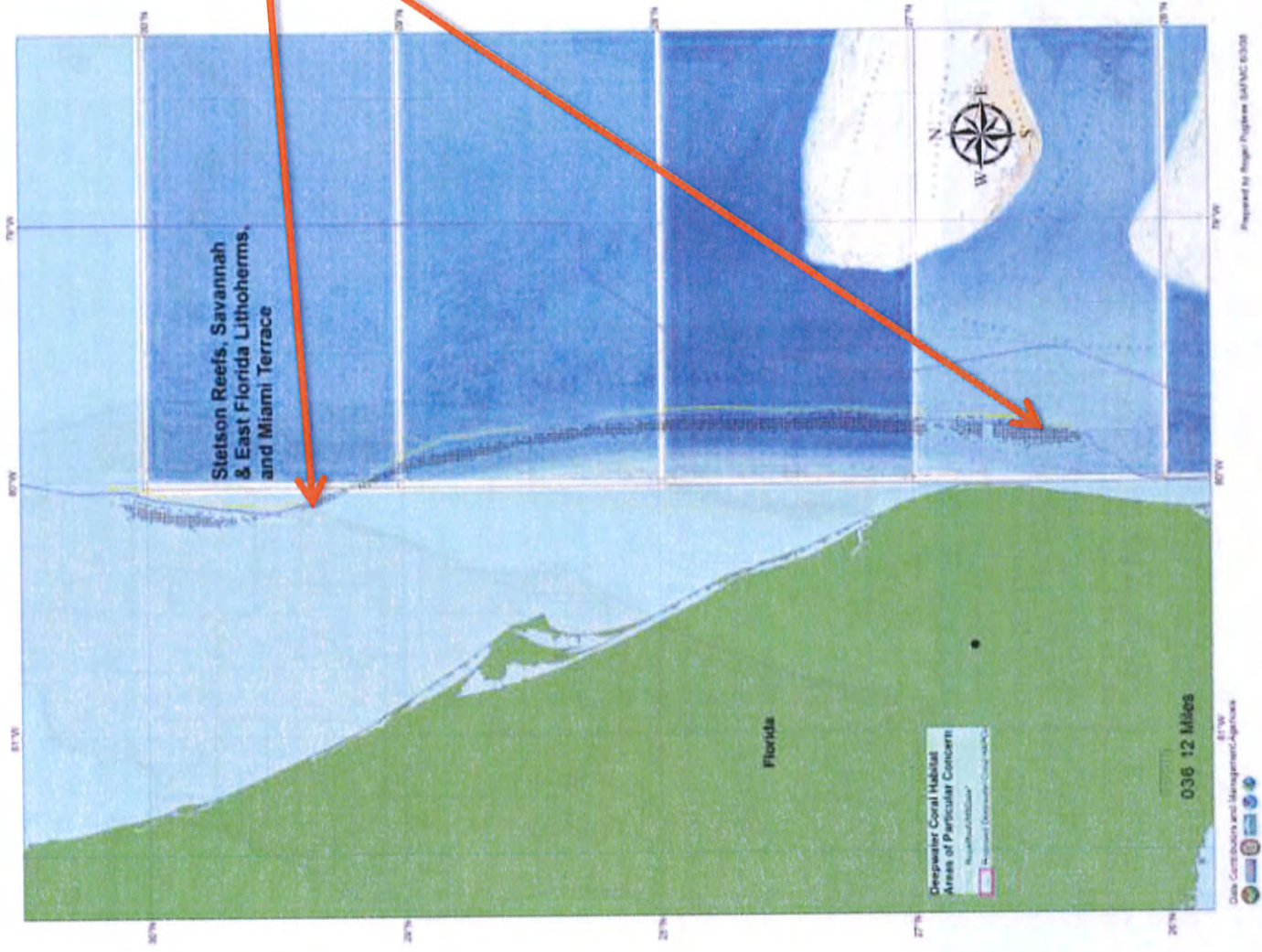


Deepwater Shrimp Vessel Monitoring System Data Characterizing the Royal Red Shrimp Fishery: Evaluating Alternatives for Establishing the Western Boundary of the Stetson-Miami Terrace CHAPC



Western Boundary
of Stetson-Miami
Terrace CHAPC
based on High
Resolution
Bathymetry

Staff Evaluation of
VMS clarifies < 1%
royal red shrimp
effort between
2004-2007 falls
inside CHAPC



Ecosystem Based Management Committee and Council met June 2008

In cooperation with Industry and Advisory Panels refined the following measures for inclusion into Comprehensive Ecosystem Based Amendment 1 to address Deepwater Ecosystem Conservation :

- **Include Shrimp Fishery Access Areas into the document and select them as the preferred Alternative.**
- **Create a “Shrimp Fishery Access Area” (SFAA) within the proposed Stetson Reefs, Savannah and East Florida Lithoherms, and Miami Terrace C-HAPC boundaries, where fishing with a shrimp trawl and/or shrimp possession is allowed by any vessel holding a rock shrimp limited access endorsement and equipped with an approved vessel monitoring system (VMS).**
- **Include Alternatives provided by Golden Crab Fishermen (Allowable Areas) into the document and select them as the preferred Alternative.**

Fishery Ecosystem Plan



FISHERY ECOSYSTEM PLAN
OF THE SOUTH ATLANTIC REGION

VOLUME I: INTRODUCTION AND OVERVIEW

April 2009

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THIS IS A PUBLICATION OF THE SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL PURSUANT TO National Oceanic and Atmospheric Administration Award No. FA403NMF410004

Supporting documentation for
Comprehensive Ecosystem-Based
Amendment 1 :
Applicable Volumes and Sections-

Volume II: Habitats and Species
Descriptions of Coral Ecosystem,
Deepwater Shrimp and Golden
Crab

Volume III: Human and Institutional
Environment
Descriptions of Deepwater Shrimp
an Golden Crab Fisheries

Comprehensive Ecosystem-Based Amendment 1



COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 1 FOR THE SOUTH ATLANTIC REGION



AMENDMENT 8 TO THE FISHERY MANAGEMENT PLAN FOR THE SHELLFISH FISHERY OF THE SOUTH ATLANTIC REGION
AMENDMENT 19 TO THE FISHERY MANAGEMENT PLAN FOR THE COASTAL, NEARSHORE PELAGIC RESOURCES IN THE ATLANTIC AND GULF OF MEXICO
AMENDMENT 6 TO THE FISHERY MANAGEMENT PLAN FOR CORAL, CORAL REEFS, AND LIVE HARD BOTTOM HABITATS OF THE SOUTH ATLANTIC REGION
AMENDMENT 4 TO THE FISHERY MANAGEMENT PLAN FOR THE GOLDEN CRAB FISHERY OF THE SOUTH ATLANTIC REGION
AMENDMENT 9 TO THE FISHERY MANAGEMENT PLAN FOR SPINY LOBSTER IN THE GULF OF MEXICO AND SOUTH ATLANTIC
AMENDMENT 1 TO THE FISHERY MANAGEMENT PLAN FOR THE DOLPHIN WAREHOUSING FISHERY OF THE ATLANTIC
AMENDMENT 19 TO THE FISHERY MANAGEMENT PLAN FOR THE SWAMPY GRASS CRAB FISHERY OF THE SOUTH ATLANTIC REGION

(INCLUDING A FEES, DEFA, FEIR, & FSLA FES)

October 2009

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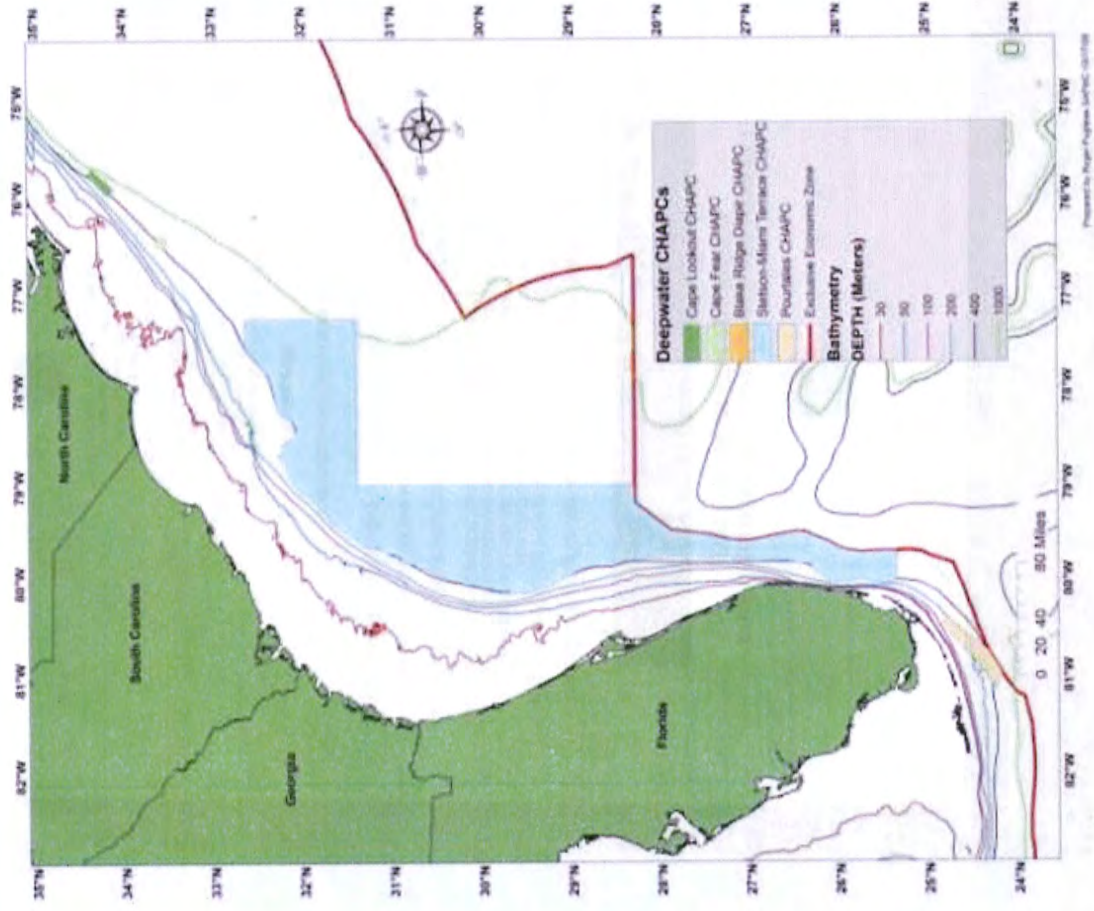
This is a publication of the South Atlantic Fishery Management Council pursuant to National Oceanic and Atmospheric Administration, Internal No. FN161616P4410004

J. Reed, HBO 12/2006

Ecosystem-Based Spatial Management Coral Habitat Areas of Particular Concern

CE-BA 1 Establishes Five
Deepwater Coral Habitat Areas
of Particular Concern :

1. Cape Lookout *Lophelia* Banks
CHAPC
2. Cape Fear *Lophelia* Banks
CHAPC
3. Blake Ridge Diapir CHAPC
4. Stetson Reefs, Savannah and
East Florida Lithoherms and
Miami Terrace CHAPC
5. Pourtales Terrace CHAPC

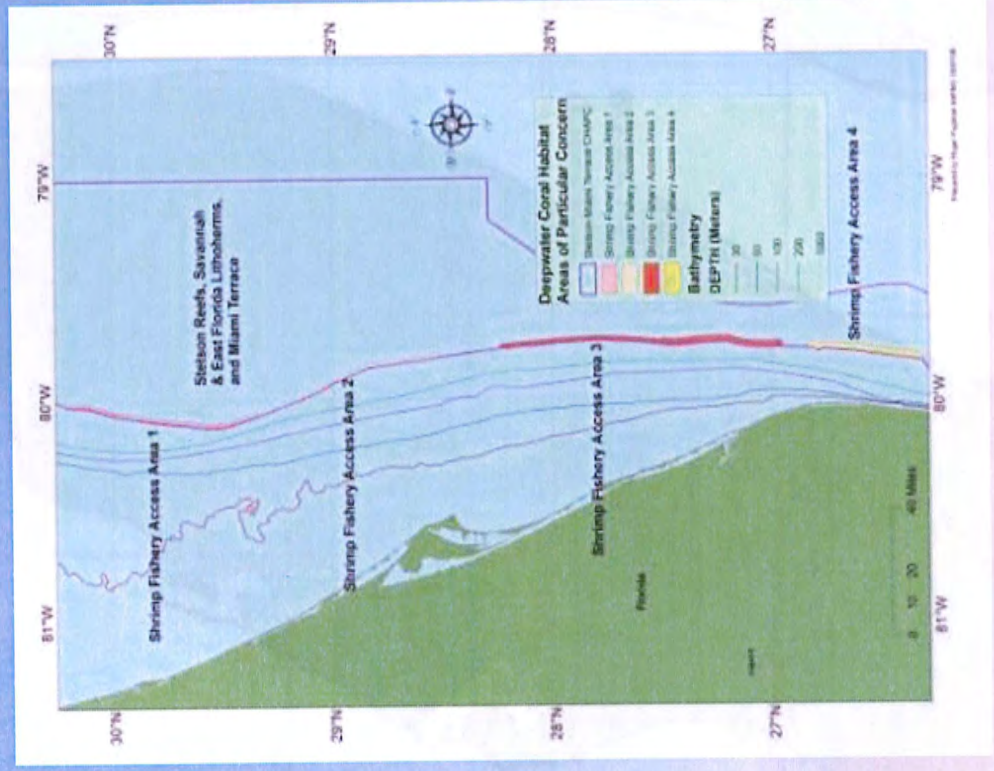


Shrimp Fishery Access Areas and Allowable Golden Crab Fishing Areas

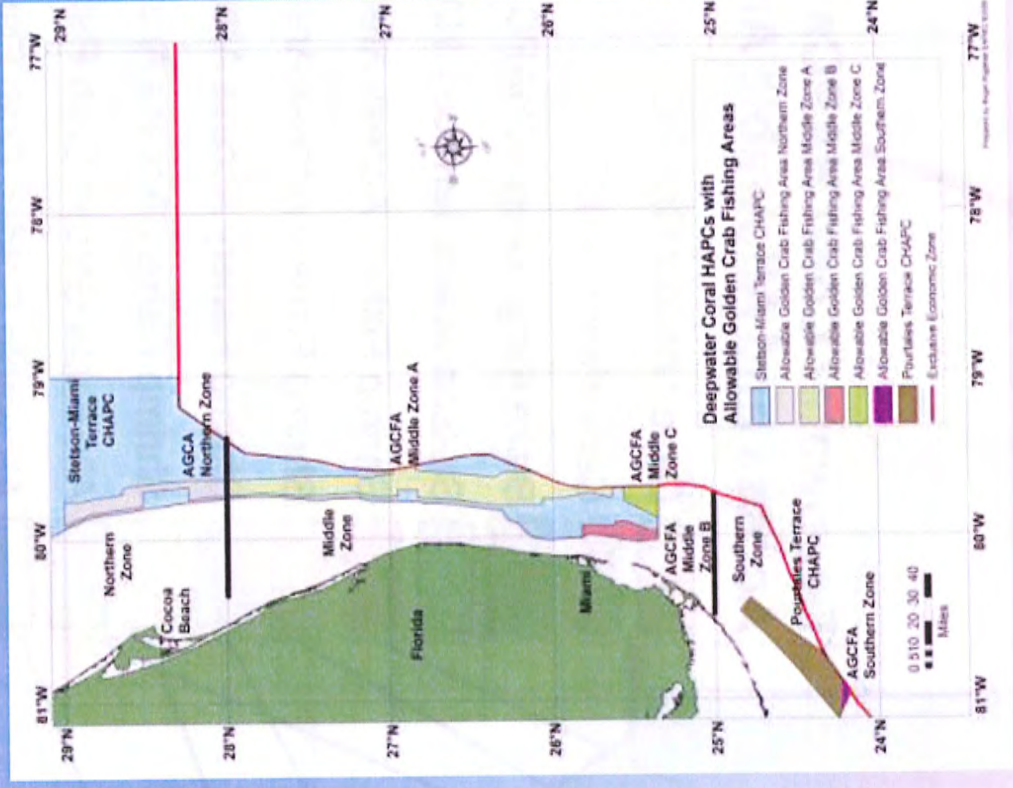
- Recognized traditional *Golden Crab and Shrimp Fishing* grounds were within proposed DWC-HAPC boundary.
- Sought input from royal red shrimp and golden crab fishermen and Advisory Panels as to potential alternatives.
- Utilized expanded knowledge from DWC Research & Monitoring Plan related mapping to develop and refine alternatives

Shrimp Fishery Access Areas and Allowable Golden Crab Fishing Areas



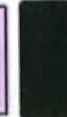












Shrimp Fishery Access Areas

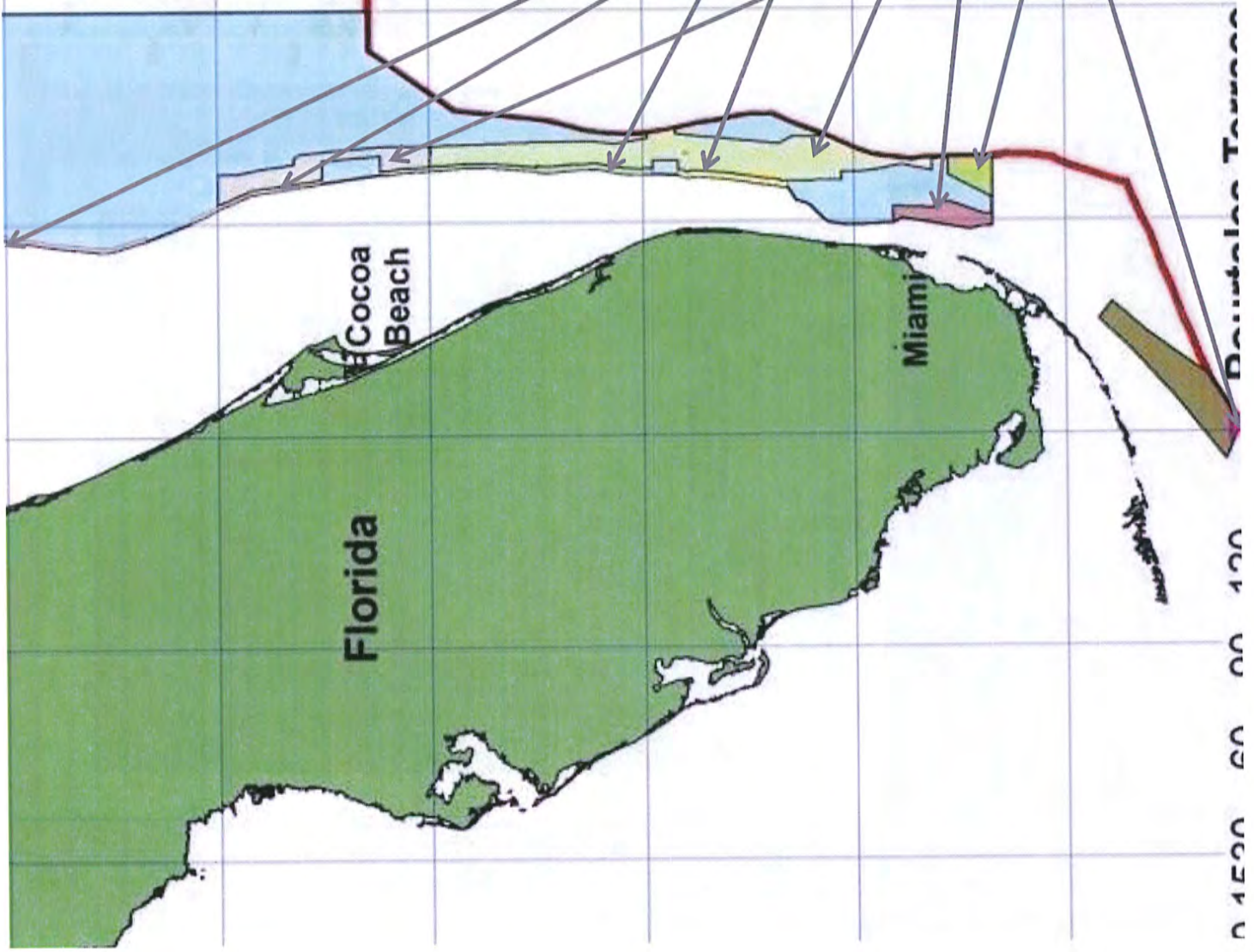


Golden Crab Allowable Gear Areas



Deepwater Coral HAPCs with Access and Allowable Areas

-  Cape Lookout CHAPC
-  Cape Fear CHAPC
-  Blake Ridge Diapir CHAPC
-  Stetson-Miami Terrace CHAPC
-  Shrimp Fishery Access Area 1
-  Shrimp Fishery Access Area 2
-  Shrimp Fishery Access Area 3
-  Shrimp Fishery Access Area 4
-  Allowable Golden Crab Fishing Area:
-  Allowable Golden Crab Fishing Area:
-  Allowable Golden Crab Fishing Area:
-  Allowable Golden Crab Fishing Area:
-  Allowable Golden Crab Fishing Area:
-  Pourtales Terrace CHAPC
-  Exclusive Economic Zone



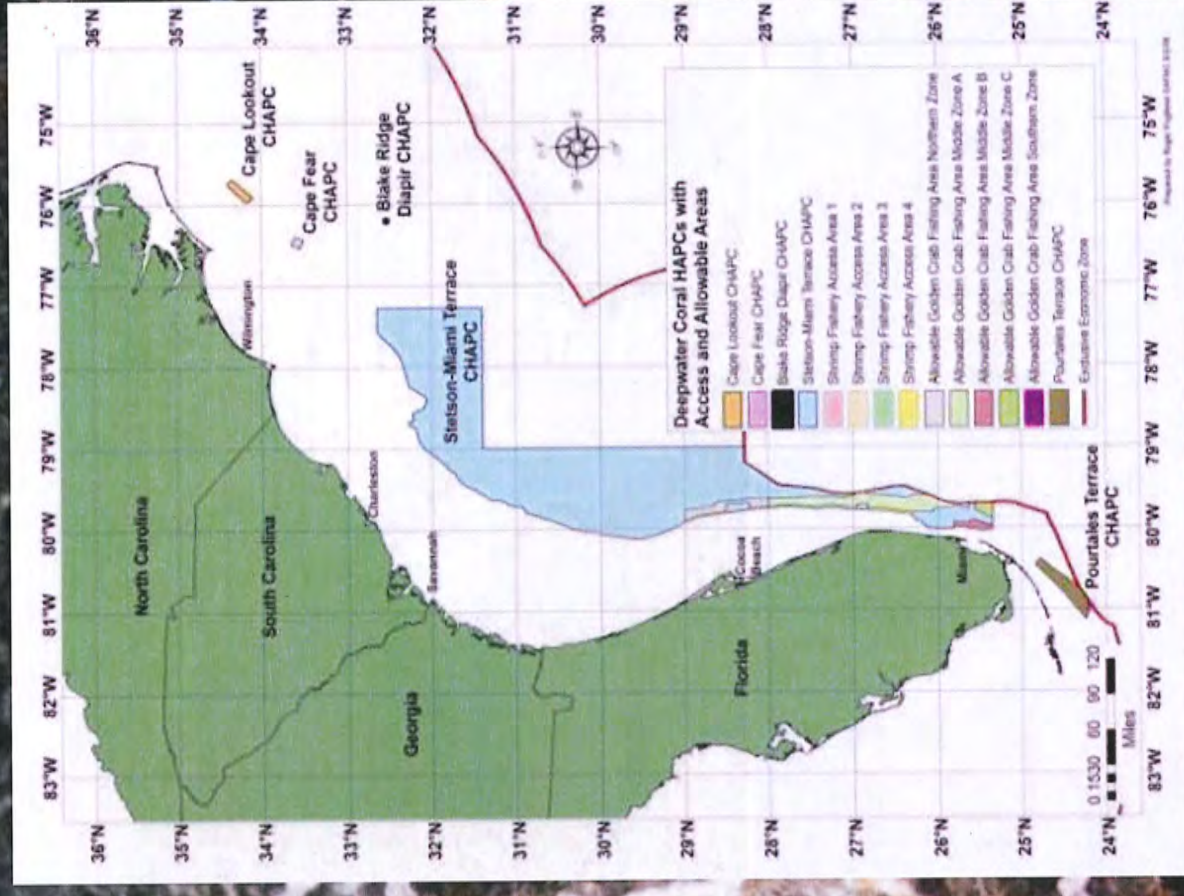
80 90 100

Pourtales Terrace

Ecosystem-Based Spatial Management Deepwater Coral Habitat Areas of Particular Concern

Conflict Resolution:

- The majority of the fishery's traditional fishing grounds were captured in the design of the proposed DWC-HAPC areas.
- Compatible areas for fishing activities were identified that provided access, while protecting the resources
- *Five Allowable Golden Crab Fishing Areas and Four Allowable Shrimp Fishing Areas were designated.*



Restrictions In the Deepwater Coral HAPCs *Effective July 22, 2010*

No person may:

(i) Use a bottom longline, trawl (midwater or bottom), dredge, pot, or trap.

(ii) If aboard a fishing vessel, anchor, use an anchor and chain, or use a grapple and chain.

(iii) Fish for coral or possess coral in or from the Deepwater Coral HAPC on board a fishing vessel.



Development of Habitat and Ecosystem Support Tools Enhancing Information Transfer and Management of Deepwater Ecosystems:

South Atlantic Habitat and Ecosystem Webpage

South Atlantic Habitat and Ecosystem Internet Map Server (IMS)

Transition to linked GIS Services for Regulations, Essential Fish Habitat, SA Fisheries, Ocean Energy and Ecospecies Data System as Part of a Digital Dashboard

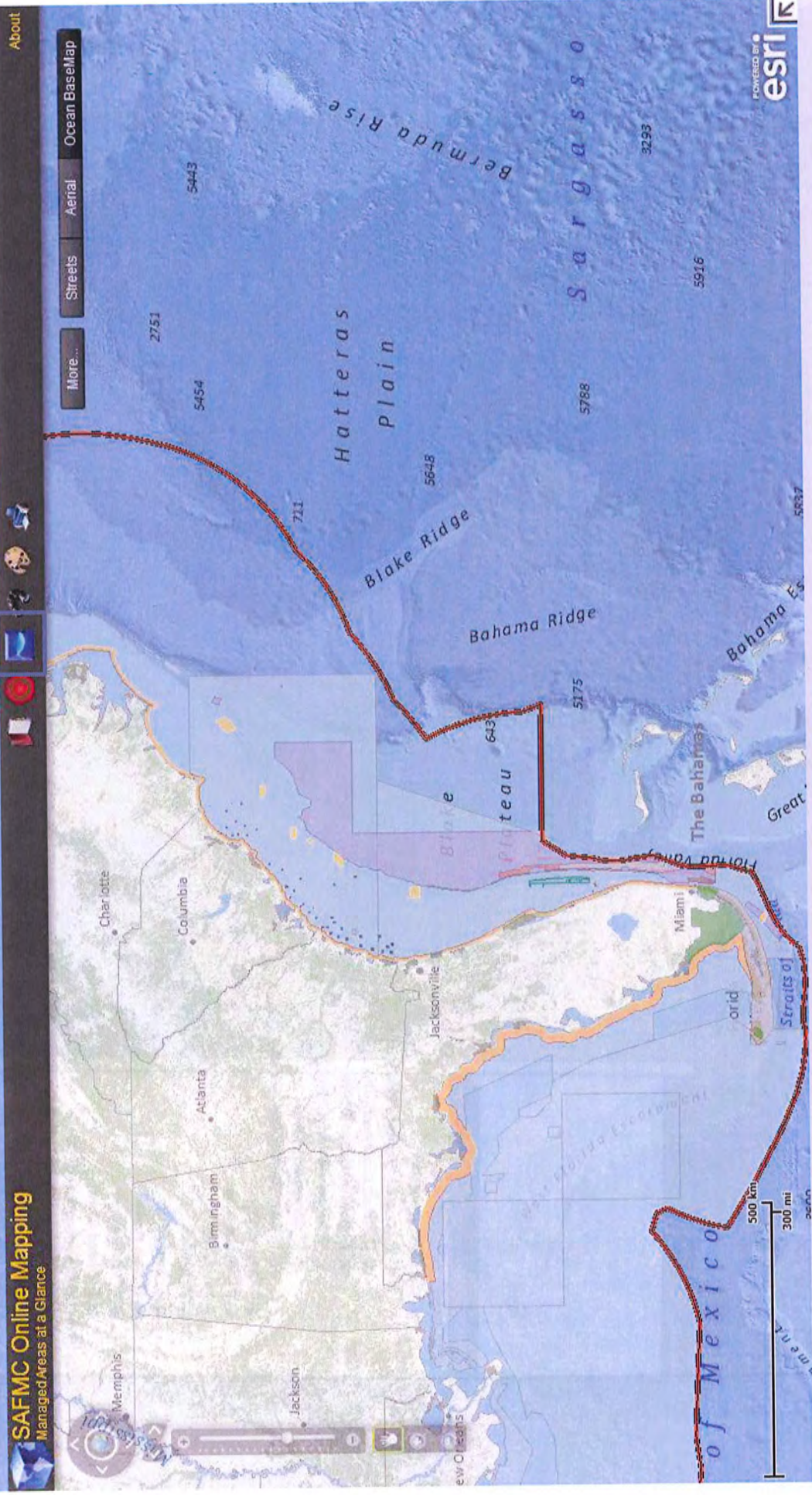
- Developed in cooperation with Florida Fish and Wildlife Research Institute to support ecosystem-based resource management, habitat, species and ecosystem research, and regional collaboration
 - Web Services provide access to related GIS data
 - Ecosystem Section of the Website provides links to FEP and Digital Dashboard
 - Developing Ecospecies data system will provide online access to South Atlantic species life history data

SAFMC Map Services

- **Essential Fish Habitat (EFH)** – displays EFH and EFH-HAPCS for SAFMC managed species and NOAA Fisheries Highly Migratory Species.
- **Fisheries** - displays Marine Resources Monitoring, Assessment, and Prediction (MARMAP) and Southeast Area Monitoring and Assessment Program (SEAMAP) data .
- **Managed Areas**- displays a variety of regulatory boundaries (SAFMC and Federal) or management boundaries within SAFMC’s jurisdiction.
- **Habitat*** – displays habitat data collected by SEADESC, Harbor Branch Oceanographic Institute (HBOI) and Ocean Exploration dives, as well as the SEAMAP shallow and ESDIM deepwater bottom mapping projects, multibeam imagery, and scientific cruise data.

* Habitat service is forthcoming

SAFMC Managed Areas



The graphic displays the initial view of the SAFMC Managed Areas viewer. Deepwater Coral HAPCs, Marine Protected Areas, Special Management Zones, and the Oculina CHAPC are visible.

SAFMC Essential Fish Habitat Service

Return To Home Page | Help | Downloads | Disclaimer

SAFMC - Essential Fish Habitat

Print | Query SAFMC EFH | Query SAFMC EFH-HAPC

Results

Map Contents

- SAFMC_EFH_SERVICE
 - SAFMC EFH-HAPC
 - Coastal Migratory Pelagic
 - Coral, Coral Reef, Live
 - Dolphin-Wahoo EFH-HAF
 - Snapper Grouper EFH-HAF
 - Shrimp EFH-HAPC
 - Spiny Lobster EFH-HAF
 - SAFMC EFH
 - Atlantic Tunas
 - Sharks
 - Sailfish
 - Sword Fish
 - Blue Marlin
 - White Marlin
 - United States
- ESRI_StreetMap_World_2D
- World Street Map
- Topo Maps
 - NGS USA Topographic Maps

0 25 50 100 150 200 Miles Copyright

South Atlantic Web Accessible Materials (SAFMC)

- Fishery Ecosystem Plan- (viewable and downloadable by Section)- <http://www.safmc.net/ecosystem/Home/EcosystemHome/tabid/435/Default.aspx>
- CEBA1 - [http://www.safmc.net/Portals/6/Library/FMP/CE-BA1%20FINAL%20\(Oct%202009\).pdf](http://www.safmc.net/Portals/6/Library/FMP/CE-BA1%20FINAL%20(Oct%202009).pdf)
- Habitat and Ecosystem Internet Map Server - <http://www.safmc.net/EcosystemManagement/EcosystemBoundaries/MappingandGIS/Data/tabid/632/Default.aspx>
- Managed Areas Web Service - http://ocean.floridamarine.org/safmc_managedareas/
- Essential Fish Habitat Web Service - http://ocean.floridamarine.org/sa_ehf/
- Fisheries Web Service – http://ocean.floridamarine.org/sa_fisheries/
- Ocean Energy and Habitat Services – Under development
- Ecospecies online species life history data system- Under development
- Habitat and Ecosystem Digital Dashboard – Online June 2012

Regional Data Collection Efforts Southeast Coastal Ocean Observing Regional Association (SECOORA): Relationship to SAFMC Managed Areas including Deepwater CHAPCs

Southeast Coastal Ocean Observing Regional Association (SECOORA) Build Out Plan

Submitted to NOAA IOOS

September 30, 2011

A Unique Region

The SECOORA region encompasses 4 states, over 42 million people and spans the coastal ocean from North Carolina to the west Coast of Florida. The region is vulnerable to hurricane hazards, potential impacts from oil drilling off Cuba and neighboring regions, and climate change because of low-lying coastal land and corals and other habitats that will be the first indicators of significant ecological impact. A regional observing system is critical to understanding risks and reducing impacts, as well as supporting the economy of the SE. SECOORA is creating customized products to address these thematic areas: Marine Operations; Coastal Hazards; Ecosystems, Water Quality, and Living Marine Resources; and Climate Change.

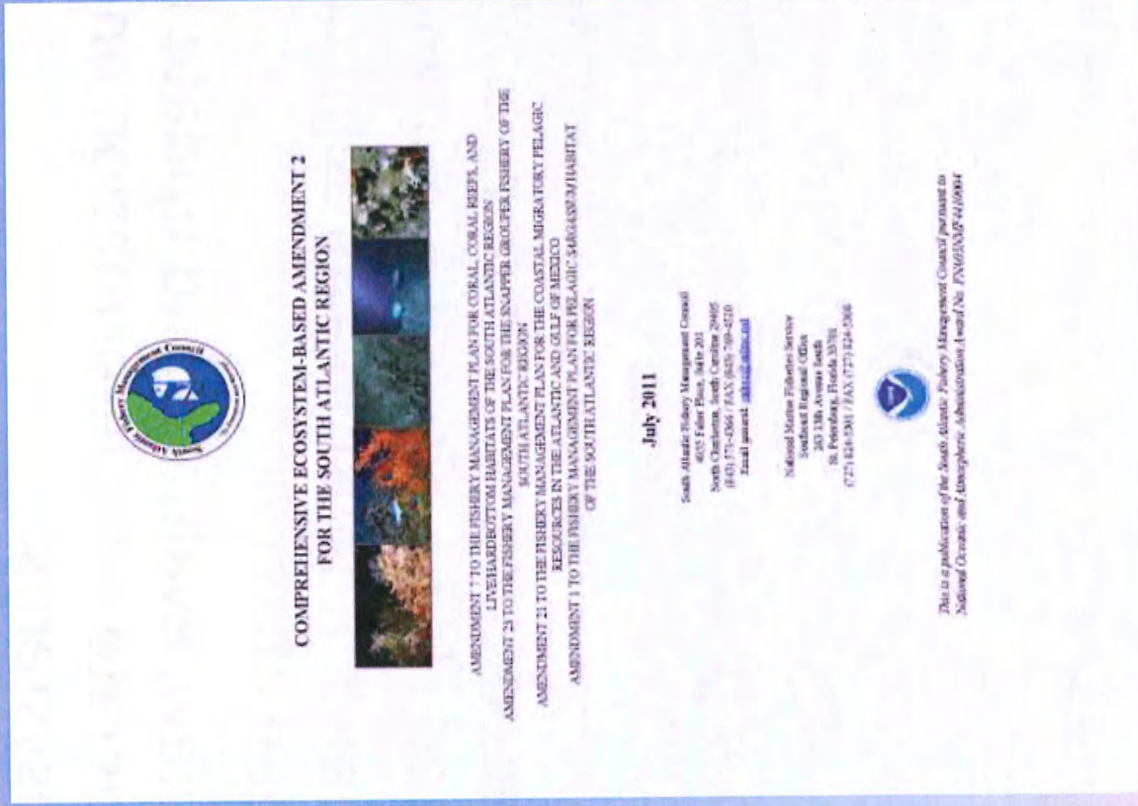



Figure 1 The SECOORA Footprint


The SECOORA region is linked through large-scale circulation patterns. The western boundary current (WBC) of the North Atlantic, comprised of the Loop Current/Florida Current/Gulf Stream system, interacts strongly with coastal waters, intimately coupling the SECOORA region to the global circulation. Changes in shelf width across the region and changes in circulation with time modulate the degree to which the deep ocean interacts with the nearshore environment but throughout the region shelf water properties reflect the WBC influence.

Comprehensive Ecosystem Based Amendment 2

On Measure in approved
CE-BA 2 is the Designation
of Deepwater Marine
Protected Areas and
Deepwater Coral Habitat
Areas of Particular
Concern as Essential Fish
Habitat – Habitat Areas of
Particular Concern




**COMPREHENSIVE ECOSYSTEM-BASED AMENDMENT 2
FOR THE SOUTH ATLANTIC REGION**




AMENDMENT 7 TO THE FISHERY MANAGEMENT PLAN FOR CORAL, CORAL REEFS, AND
LIVE-HARD-BOTTOM HABITATS OF THE SOUTH ATLANTIC REGION
AMENDMENT 23 TO THE FISHERY MANAGEMENT PLAN FOR THE SNAPPER GROUPER FISHERY OF THE
SOUTH ATLANTIC REGION
AMENDMENT 21 TO THE FISHERY MANAGEMENT PLAN FOR THE COASTAL MIGRATORY PELAGIC
RESOURCES IN THE ATLANTIC AND GULF OF MEXICO
AMENDMENT 1 TO THE FISHERY MANAGEMENT PLAN FOR PELAGIC MARIGONS/HABITAT
OF THE SOUTH ATLANTIC REGION

July 2011

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National Oceanic and Atmospheric Administration Award No. FWS/DAWP-01/0004

Ongoing and Future Deepwater Coral Ecosystem Activities in the South Atlantic Region

- Ongoing review and evaluation of DWC Research and Monitoring Plan progress and objectives.
- Support for research, characterization and mapping of deepwater coral ecosystems.
- Evaluate need for expanded spatial management as needed through a future Comprehensive Ecosystem-Based Management Amendment.
- Expand monitoring through collaboration with regional ocean observing.
- Review, evaluate and update Fishery Ecosystem Plan to integrate new information on deepwater coral ecosystems.



Questions?

A photograph of a deep-sea coral reef. The scene is dimly lit, showing various types of coral and sponges in shades of purple, blue, and brown. A prominent red crab is visible in the upper right quadrant of the image. The overall atmosphere is mysterious and highlights the biodiversity of deep-sea ecosystems.

Deep-sea coral protection zones and management measures

Michelle Bachman

New England Fishery Management Council Staff
Habitat Plan Development Team Chair

Mid-Atlantic Fishery Management Council
Ecosystem and Ocean Planning Committee

April 10, 2012 · Duck, NC



Deep-sea corals



- For these measures and the purposes of NOAA's coral program, deep-sea corals are defined as those species that live at 50 m (27.3 fathoms) or deeper
- There are a few different types in our region:
 - Hard/stony corals
 - Gorgonians and soft corals
 - Sea pens
 - Black corals, which have only been documented on seamounts thus far
- There is variation in shape, size, flexibility, substrate affinity, and distribution between groups; corals in our area are not reef builders
- Coral protection zones and associated fishing restrictions focus on:
 - Structurally complex corals thought to be more susceptible to physical damage from fishing gear interactions
 - Coral that require hard substrates for attachment, since these substrates seem to occur in limited areas of the continental slope

Omnibus Essential Fish Habitat Amendment Process

- Amendment developed in two phases – Phase 1 included updates to EFH and Habitat Area of Particular Concern designations
 - HAPCs are by definition a subset of EFH
- HAPC proposals were solicited from the public – many of these proposals focused on deep-sea coral habitats in canyons and on seamounts
 - Council approved 11 canyon HAPCs (some with multiple canyons) and a seamount HAPC (Bear and Retriever) in 2007
 - These have yet to be implemented, pending completion of the full amendment
 - Phase 2 (ongoing) includes review of adverse effects of fishing on EFH throughout region, including within HAPCs, and development of measures to minimize adverse effects as necessary

Omnibus Essential Fish Habitat Amendment Process

- In 2007, the Magnuson Stevens Act was reauthorized to include deep-sea coral discretionary provisions
- These discretionary provisions offer more flexibility in terms of defining spatial areas for coral protection because no link to EFH designations is required
 - Maximum depths associated with proposed NEFMC EFH designations are 1500 m on the slope and 2000 m on the seamounts
 - DSC do provide structural habitat for some species of fish, but implementing coral protection measures via discretionary provisions does not rely on making this case explicitly
- Since development of coral measures began, NEFMC has been consulting with MAFMC via Habitat PDT and Committee membership
 - PDT - Tom Hoff, transitioning to Jessica Coakley
 - Committee - Gene Kray, currently Peter deFur
- Also have consulted with coral experts outside the PDT

Two management frameworks

(based on MSA discretionary provisions)

Broad areas

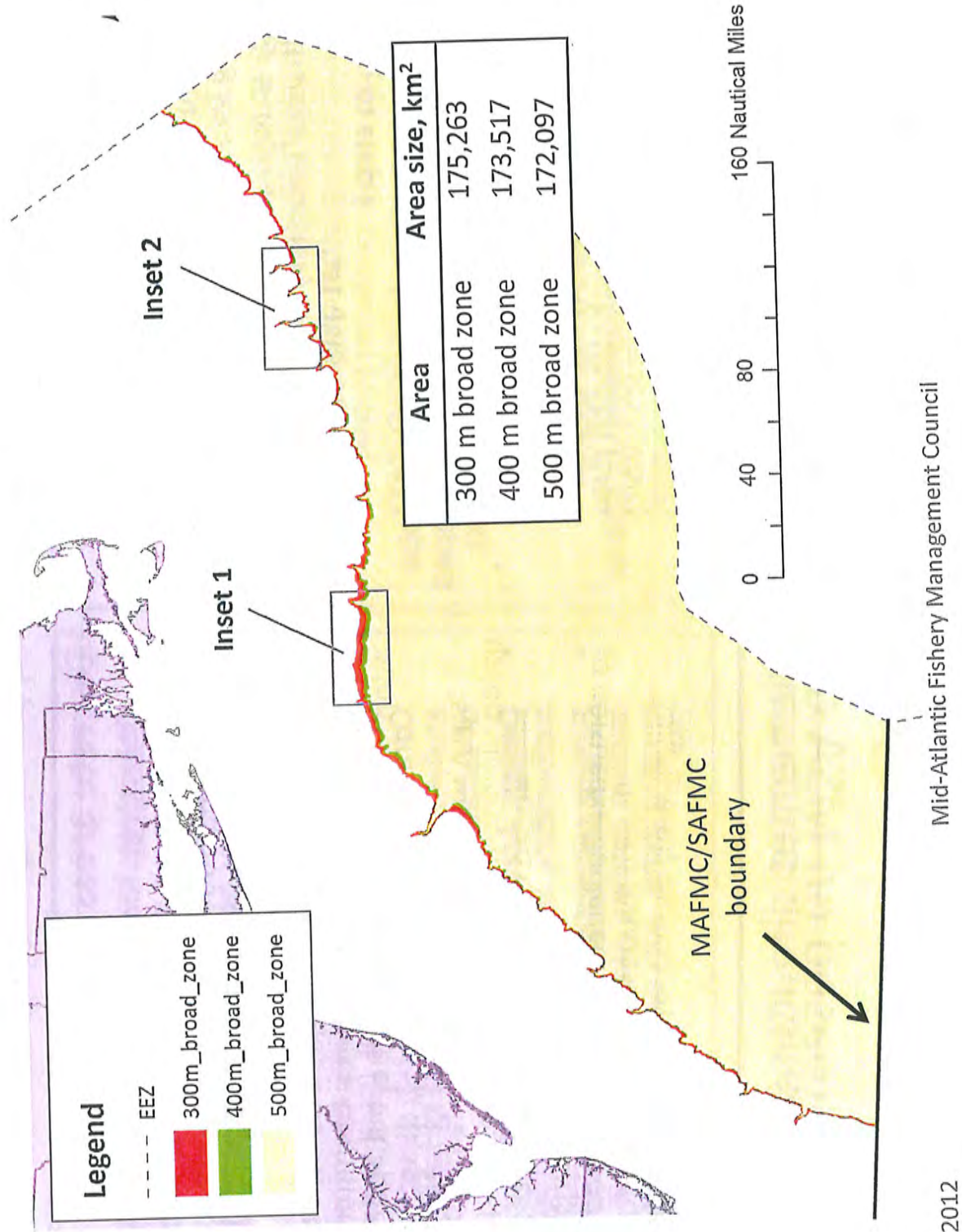
- **Objectives:** protect corals from fishing impacts while preserving fishing opportunities and managing expansion of fishing into new areas
- **Data:** Bathymetry data to define shelf/slope boundary and minimum depth for area; fishing effort data from VTRs, VMS, observers
- **Design:** a large area along the shelf/slope boundary extending to the EEZ, developed based on a selected depth contour (300, 400, or 500 m)
- **Fishing restrictions:** either no mobile bottom tending gears or no bottom tending gears, with exemptions via LOA or EFP

Discrete areas

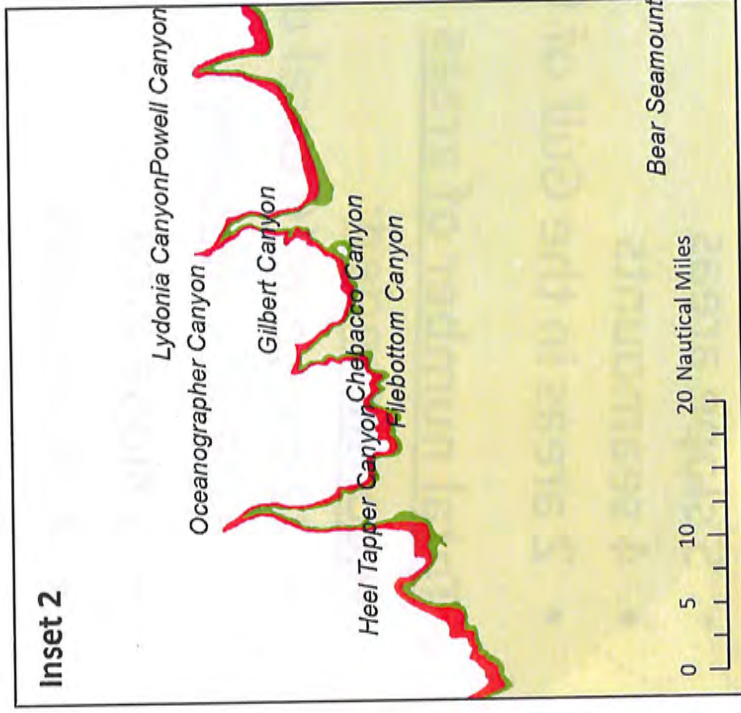
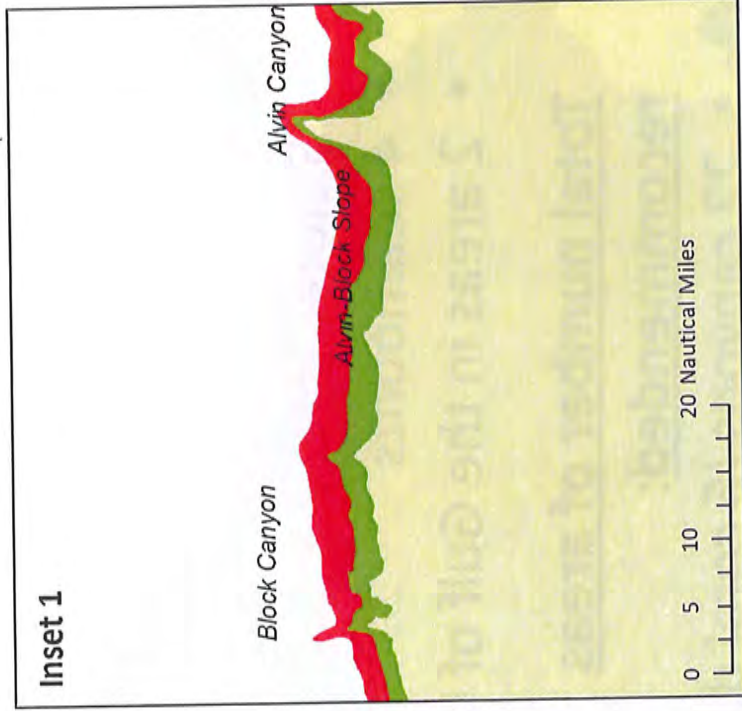
- **Objectives:** Identify smaller areas with known corals or likely to contain suitable coral habitats and minimize possible interactions between corals and fishing gear in those locations
- **Data:** Literature review of coral surveys and geological information; examination of coral presence records (Cold Water Coral Geographic database); quantitative analysis of bathymetry data to infer areas of suitable habitat.
- **Design:** Area boundaries based on bathymetry, slope, and coral distributions
- **Fishing restrictions:** either no mobile bottom tending gears or no bottom tending gears, with exemptions via LOA or EFP

Both frameworks could be implemented simultaneously

Spatial extent of broad zones

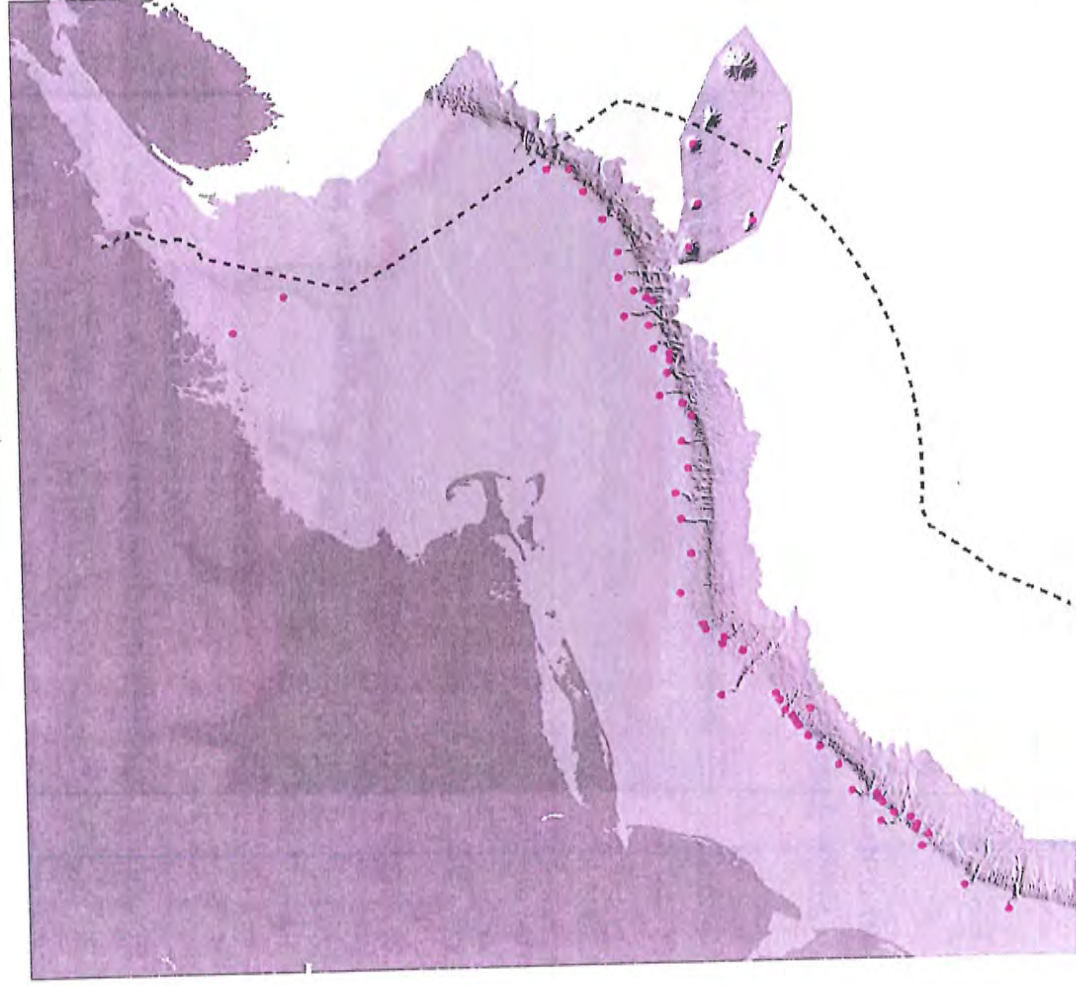


Closer view of broad zone boundaries



- Highly irregular boundary because canyons incise the shelf anywhere from 0-20 km, sometimes more.
- NEFMC Habitat Committee recommended use of actual depth contour as the boundary, rather than an approximation using a series of straight line segments
- Boundaries of the different options are further apart in more gently sloping areas, as shown on the left.

Discrete areas investigated as coral zones



Total number of areas evaluated (shown on figure):

- 48 canyons
- 5 slope areas
- 4 seamounts
- 2 areas in the Gulf of Maine

Total number of areas recommended:

- 22 canyons (6 coral data, 16 habitat suitability)
- 1 slope area
- 4 seamounts
- 2 areas in the Gulf of Maine

Basis for recommending discrete areas as coral zones

For each area, coral presence data and habitat suitability were evaluated:

	Coral presence relatively well assessed	Coral presence has not been assessed, or has been relatively poorly assessed.
Coral zone recommended	Coral presence <u>has been</u> documented	Geological and/or bathymetric data <u>do</u> support the inference of suitable habitat.
Coral zone not recommended	Coral presence <u>has not been</u> documented.	Geological and/or bathymetric data <u>do not</u> support the inference of suitable habitat.

Habitat suitability analysis

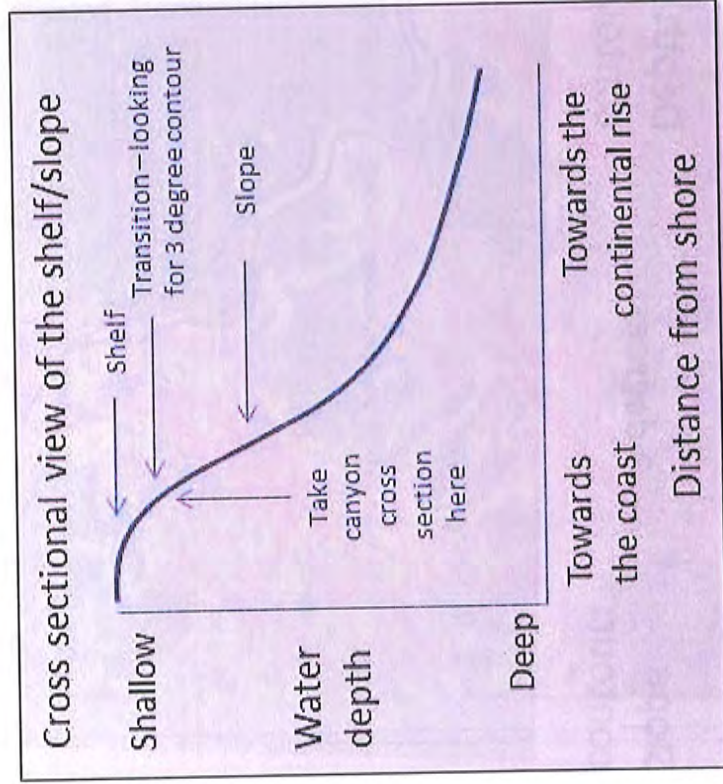
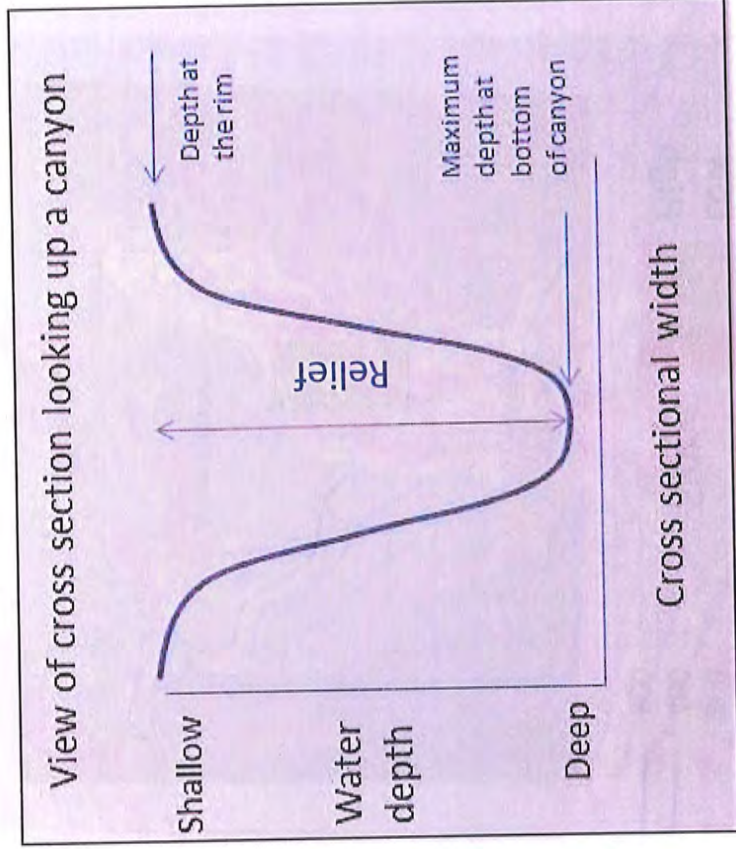
(potential canyon zones only)

- **Objective:** Determine whether an area is likely to contain outcropping rocks that provide attachment sites for corals
- **Method:** Calculate the relief of the canyon at the shelf break.
 - Canyons that have high relief at the shelf break were assumed to have higher likelihood of outcrops, because they are expected to incise the layers of fine-grained sediments at the shelf/slope break far enough to expose the underlying bedrock
 - Used a slope of 3 degrees to define the shelf break
 - A minimum threshold value of 450 m relief was used to classify canyons as likely to contain outcropping rocks

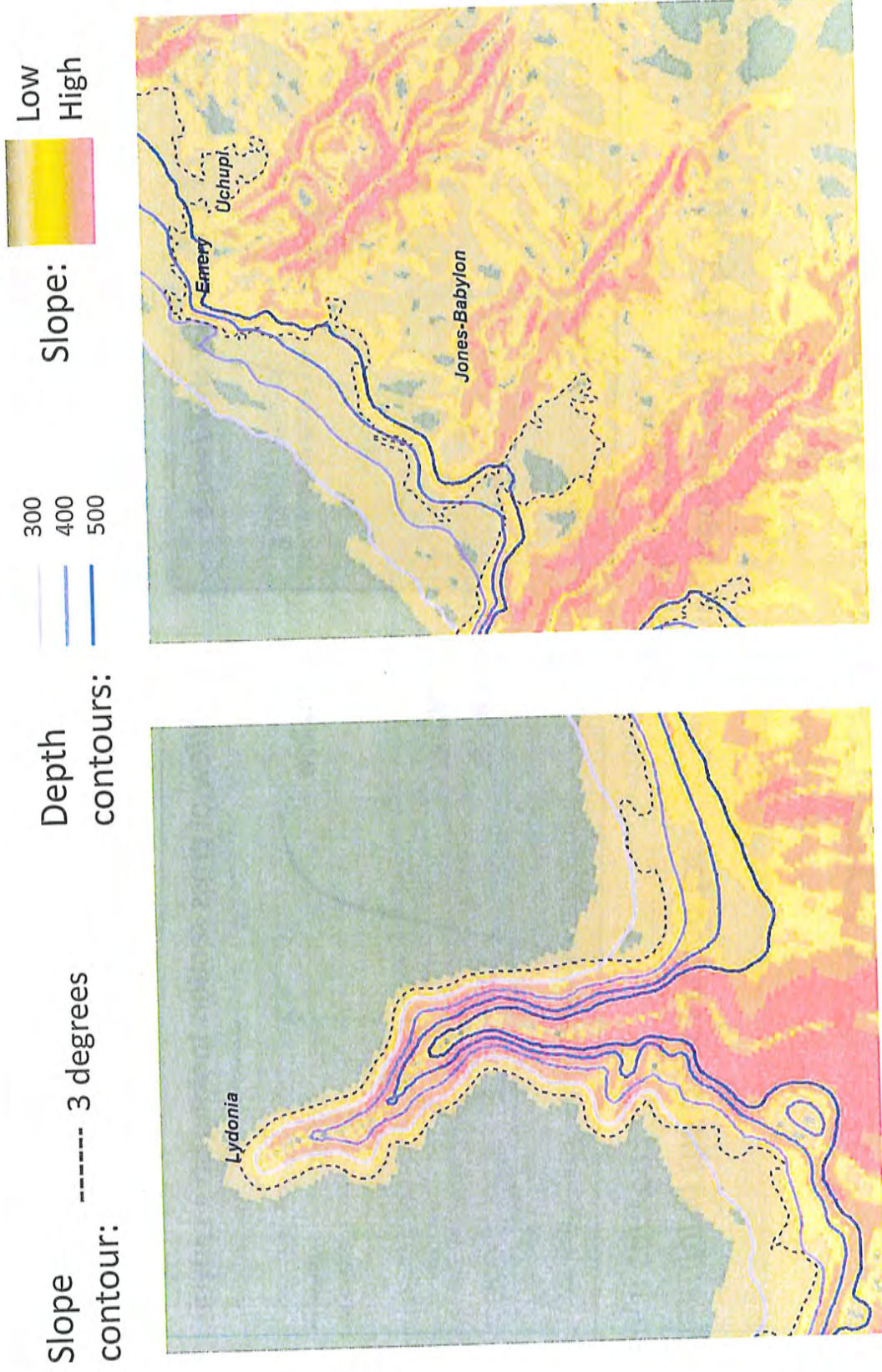
Habitat analysis

Key measurements taken (other measures made as well):

Identifying the cross section for each canyon:



Comparison between 3 degree slope contour and depth contours

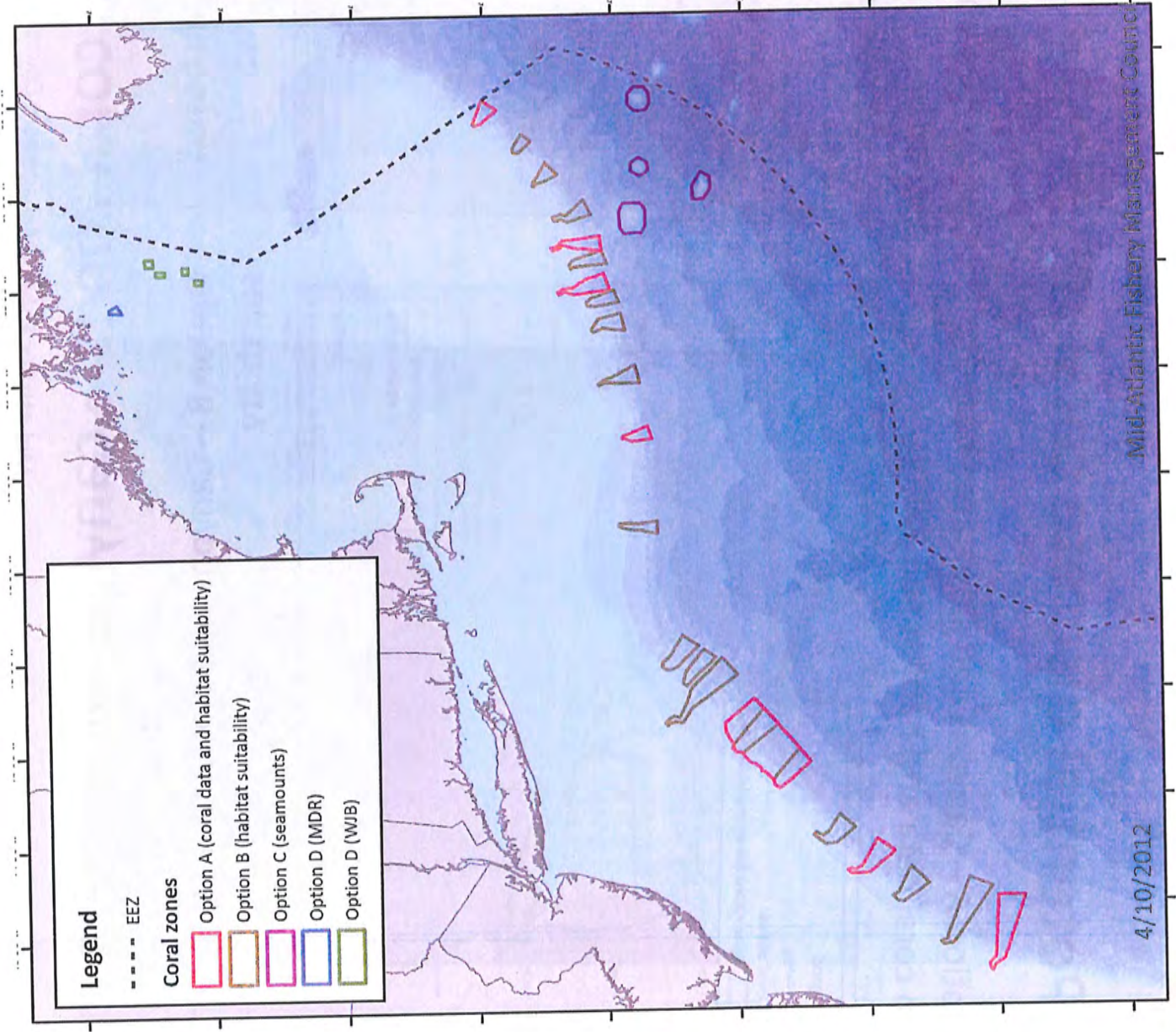


Conclusion of evaluations-
recommended potential
discrete coral zones

Landward canyon
boundaries based on 3
degree slope contour,
seaward boundaries to
encompass area of
maximum slope (red areas
on previous slide)

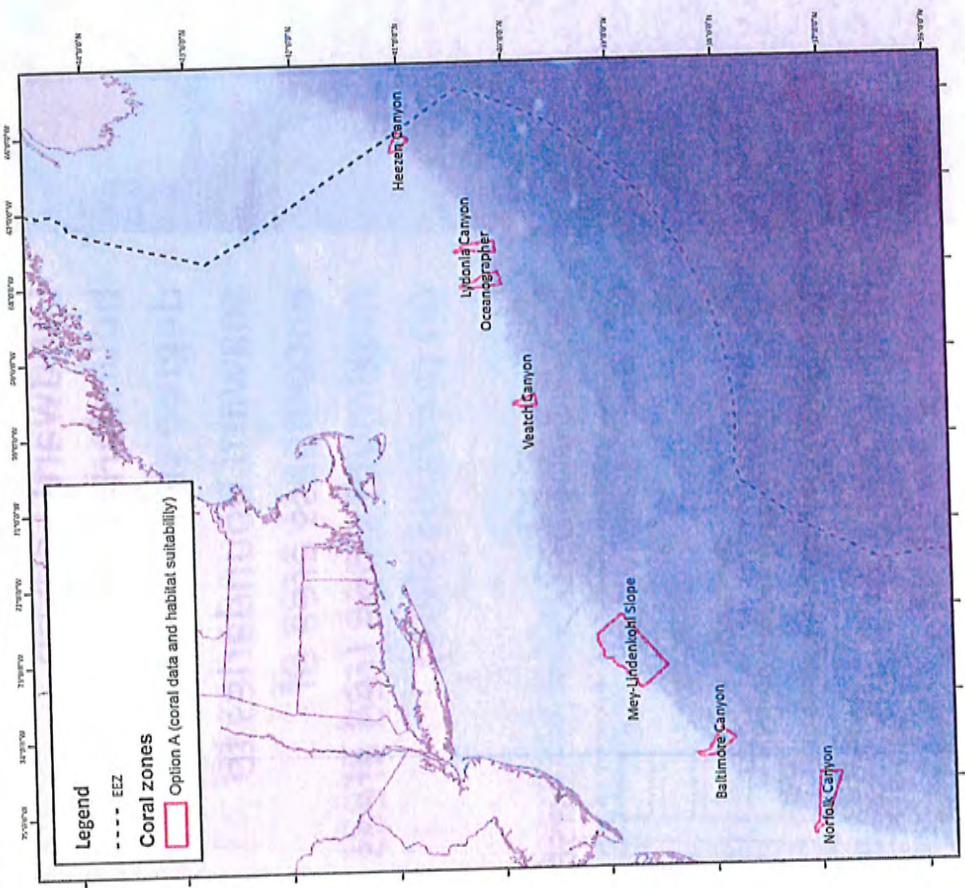
Seamount boundaries based
on bathymetry of features

GOM boundaries based on
coral observations,
bathymetry, and substrate

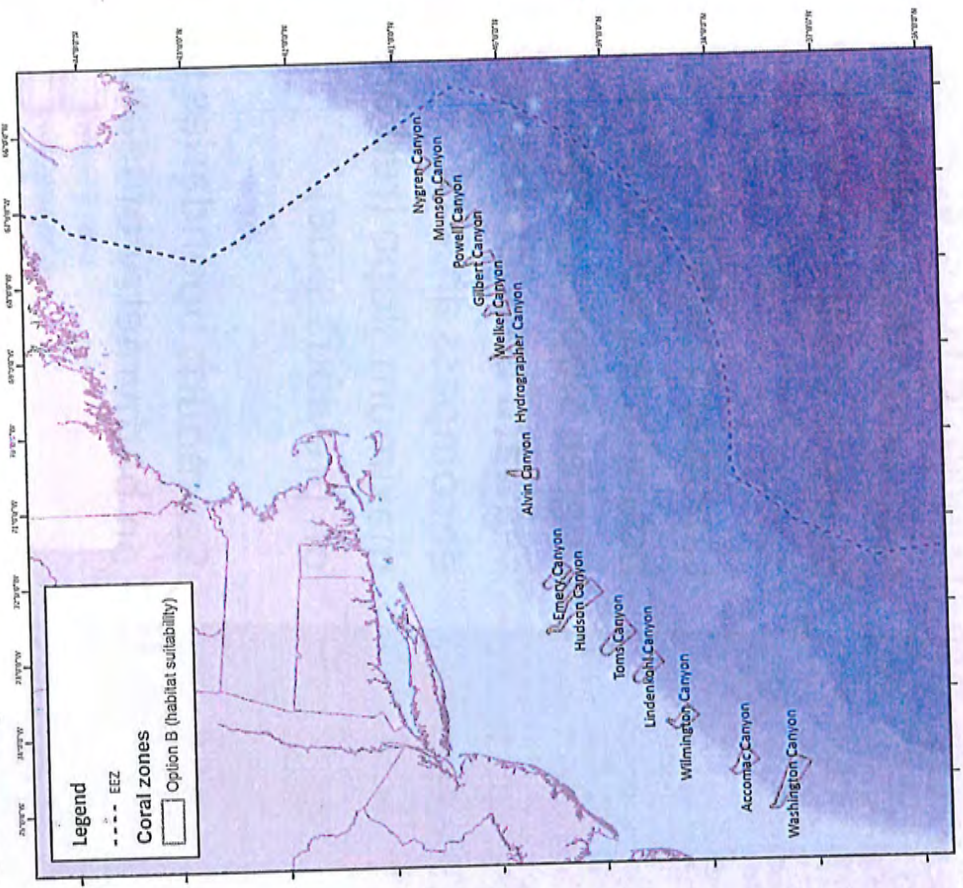


Potential discrete coral zones – canyons and slope

Option A – Canyons and slope area based on coral data and habitat suitability:

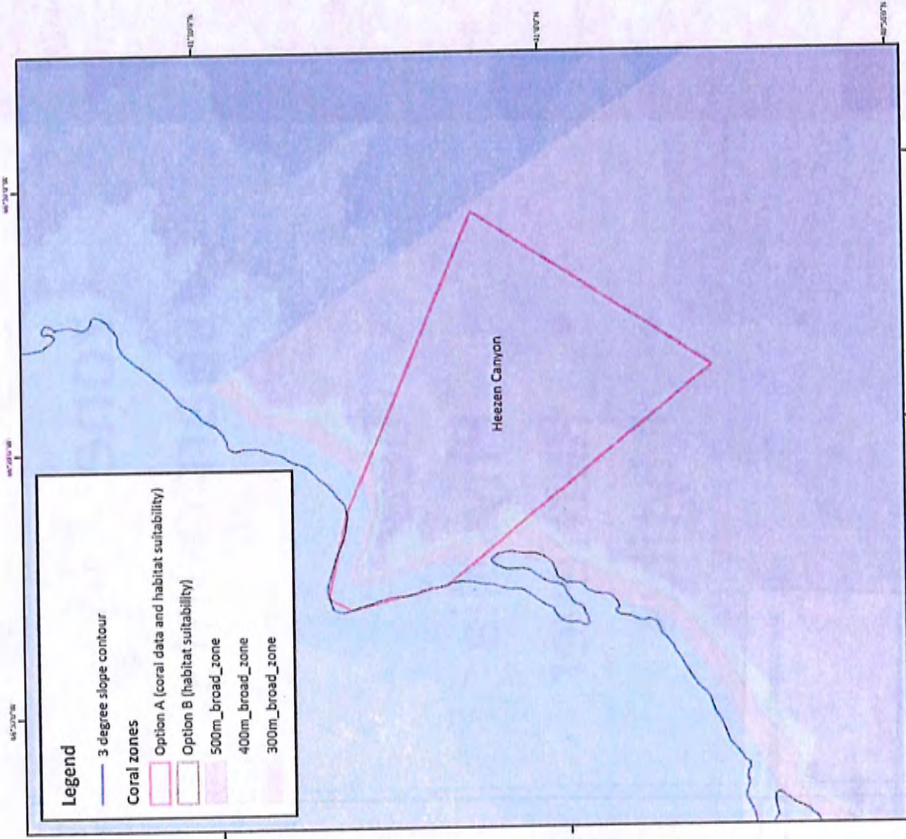


Option B – Canyons based on habitat suitability

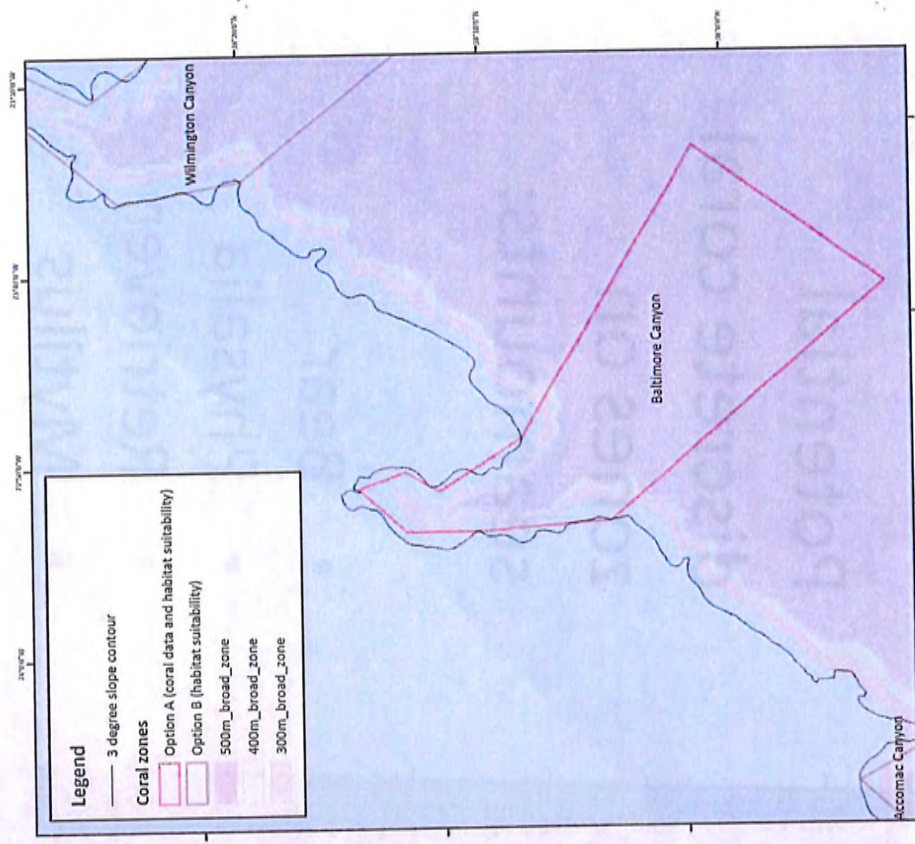


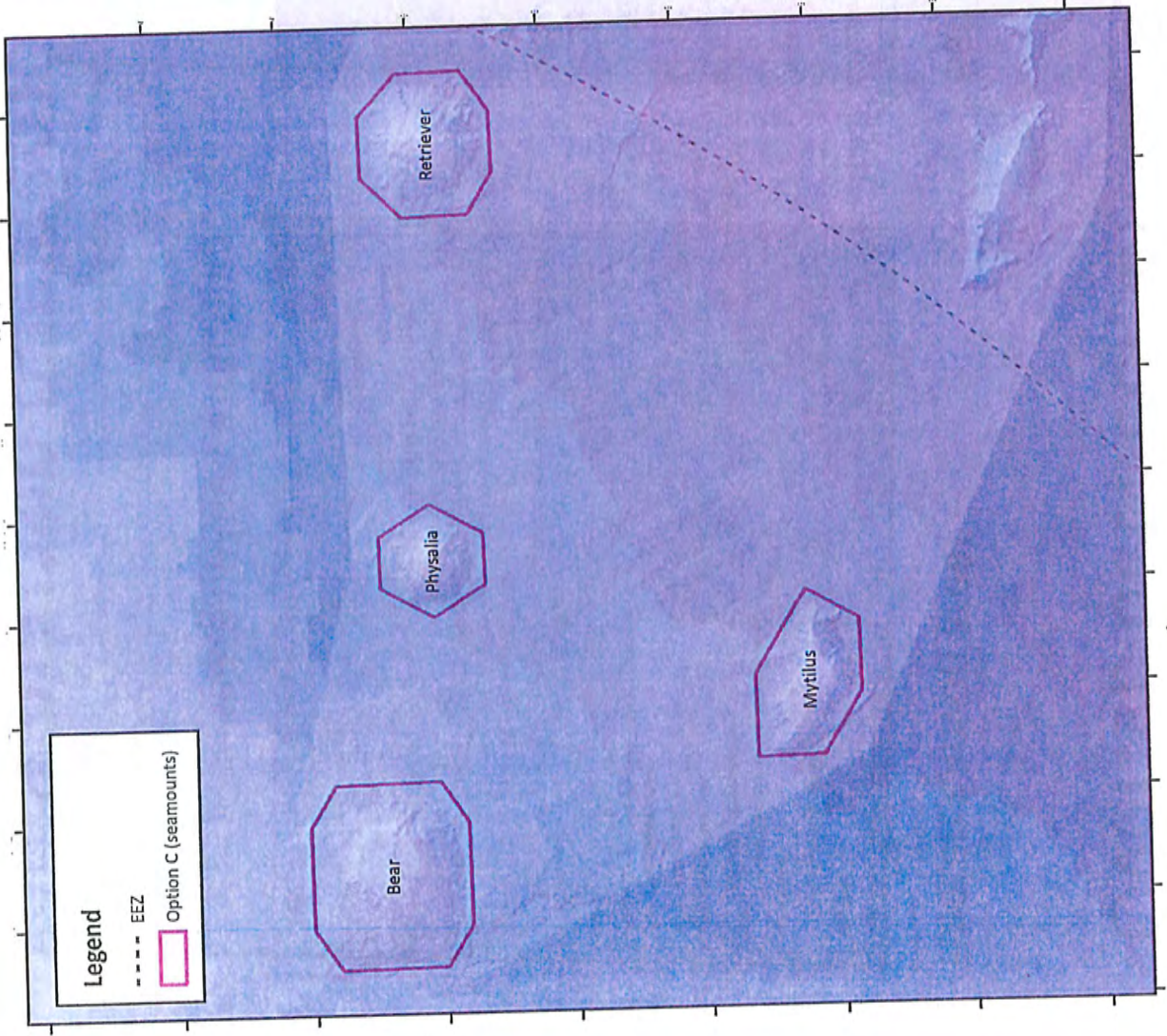
Overlap between broad and discrete zones

Heezen Canyon area:



Baltimore Canyon area:



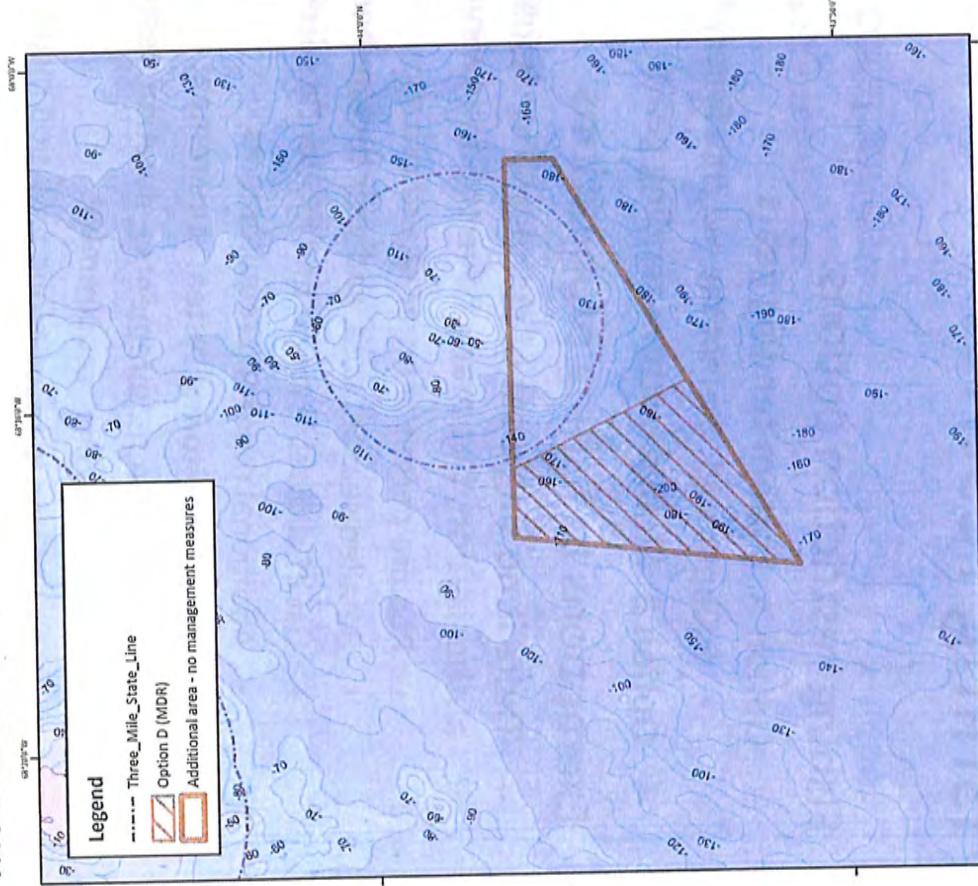


Potential discrete coral zones on seamounts:

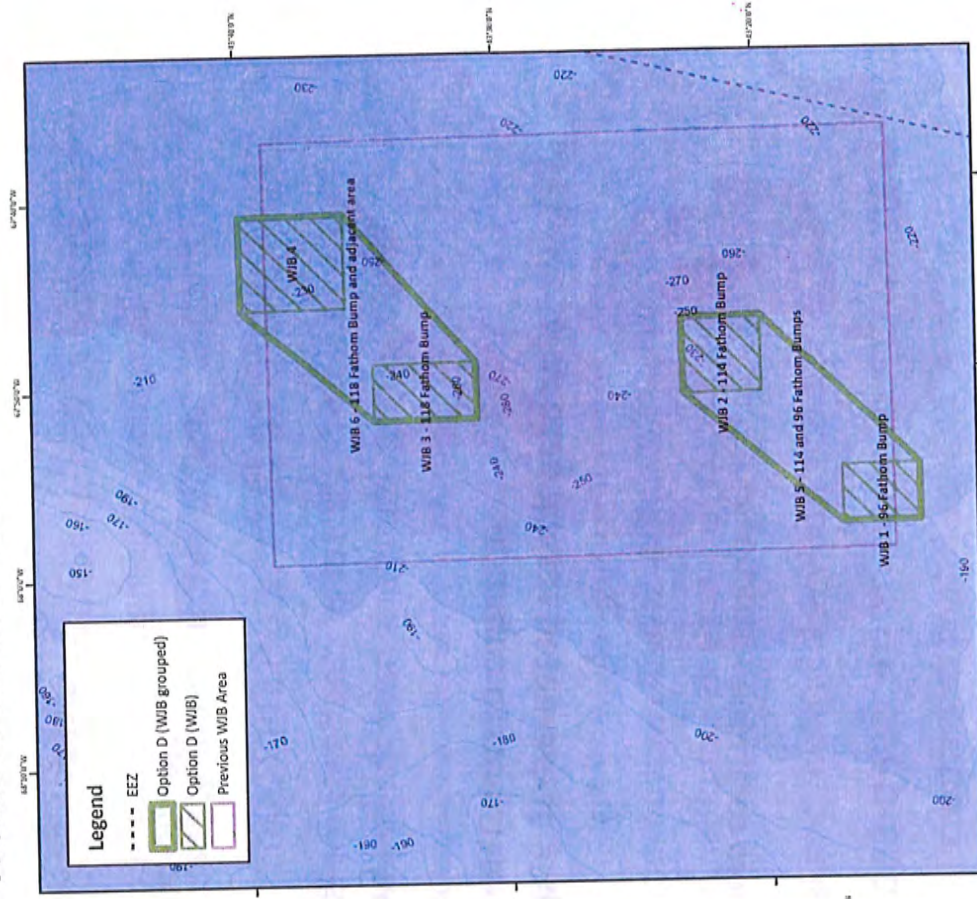
- Bear
- Physalia
- Retriever
- Mytilus

Potential discrete coral zones – Gulf of Maine

Mt Desert Rock



Western Jordan Basin



Fishing restrictions for both types of zones

- Fishing restriction options:
 - Option A: Bottom-tending gears
 - Suboption A1: Exempt the red crab fishery from coral zone restrictions
 - Option B: Mobile bottom-tending gears
- Exemptions to fishing prohibitions
 - There is no single set of standards for issuance of exempted fishing permits or letters of authorization, but many have the following elements in common:
 - Require permit or letter of authorization
 - Detailed season, area, and gear requirements
 - List of allowable target and incidental species
 - Additional reporting requirements
 - Vessel monitoring system requirement
 - Specific LOA requirements – duration, restrictions, etc.
 - "Good standing" requirement
 - In addition, a move-along provision might be appropriate
- Framework provisions for deep-sea coral zones
 - Option A: Change fishing restrictions
 - Option B: Change exemption fishery requirements

Additional information

- Recent meeting summaries – Habitat Committee (2/23), Habitat Plan Development Team (3/7)
 - Provided in briefing book
- Decision document with all management alternatives and additional maps and background document with additional information about corals, bathymetry/habitat suitability analysis, fishing impacts, coral surveys, etc.
 - See <http://nefmc.org/habitat/>, documents 5 and 6 from April 6 Committee Meeting for the most up to date drafts
- Other recent habitat meeting materials may also be of interest



**New England Fishery Management Council
Habitat Oversight Committee Meeting Summary**

**February 23, 2012
Portsmouth, NH**

Committee members: David Preble (chair), Lou Chiarella, Peter deFur, Mark Gibson, Dave Goethel, Doug Grout, Terry Stockwell. Council chair Rip Cunningham also attended.

Council staff: Michelle Bachman (PDT chair), Lou Goodreau

NMFS staff: David Stevenson (NERO/PDT), Moira Kelly (NERO/PDT)

Others: Approximately 10 additional audience members, including some habitat advisors

The Habitat Committee met to:

- (1) Discuss management alternatives for deep-sea coral protection,
- (2) Discuss/modify management options to minimize the adverse effects of fishing on Essential Fish Habitat (EFH), and forward those options to the Groundfish Committee and Plan Development Team (PDT), and
- (3) Receive a status update and discuss ideas for dedicated habitat research areas.

On January 24, the Committee met jointly with the Habitat Advisory Panel to discuss the same agenda items. A summary of that meeting is provided here: http://www.nefmc.org/habitat/meetsum/habitat_jan12.pdf. A Committee-only decision making meeting was scheduled for January 25, but cancelled due to a conflict with a Science and Statistical Committee meeting. This meeting represents a rescheduling of the January 25 meeting. Background materials were updated slightly between the two meetings and the new materials can be found here: http://www.nefmc.org/habitat/cte_mtg_docs/120223/120223.html.

Before beginning the coral agenda item, the Committee briefly discussed coordination between the Mid-Atlantic and New England councils on coral issues, between the Habitat and Groundfish Committees/PDTs on area management issues, and the SSC and NEFSC ecosystems program on developing research areas.

The plan for coordination on coral issues has not been fully developed. Currently, we are on a path to develop a single set of coral protection zone areas, with NEFMC taking the lead and MAFMC participating via the NEFMC Committee and PDT process. Enhanced coordination will be needed in terms of developing management measures that would affect fisheries managed by each council. Agency guidance regarding coordination on action taken under the coral discretionary provisions is that actions to protect corals taken by one Council can affect fisheries managed by another Council, but that there must be consultation between the Councils. Another

option that was discussed was to have NEFMC develop measures for the areas north of some boundary, and MAFMC develop measures to the south. This could be challenging as there is spatial overlap between the fisheries managed by the two Councils. Discussions between MAFMC and NEFMC members and staff are ongoing, and coordination will continue at the PDT level. Staff will likely present coral alternatives to the MAFMC at their April meeting.

In terms of coordination on area management issues, options forwarded by the Habitat Committee to the groundfish process will be communicated staff to staff at the PDT level, and via the Groundfish Committee chair, who is also a member of the Habitat Committee. Area management is on the agenda at upcoming Groundfish PDT and Committee meetings, although the timeline for work is not certain given other management priorities. Once the Groundfish Committee has had an opportunity to develop area management options to meet groundfish-related objectives, there will be a joint committee process with Habitat. Alternatives would then go to the Council to be considered for analysis.

The Habitat PDT is working on developing proposals for specific research areas. Areas will be designed to address the questions outlined in the research areas section of the adverse effects decision document. Locations will correspond with both newly proposed and existing habitat management areas. At the January 24 meeting, the PDT discussed that multiple research sites per region would be ideal, but the plan is to develop one or two sites per region as a starting point, and then seek Committee feedback. The Habitat Committee Chair noted that coordination with SSC members and others working on ecosystems issues would be useful, so that the research areas can be designed now to satisfy multiple objectives for designing and evaluating future management actions.

Management alternatives for deep-sea coral protection

Documents for this part of the meeting included:

1. Deep-sea corals of the Northeast Region: Species, habitats, and proposed coral zones, and vulnerability to fishing impacts (Doc 1)
2. Deep-sea coral management alternatives decision document (Doc 3)
3. Staff also gave a presentation on broad vs. discrete zones, highlighting some boundary development considerations.

Staff reiterated the PDT's January 24 advice on designating broad and/or discrete coral zones. She also discussed potential boundary considerations. Regarding both types of zones, but for the broad zone in particular, she noted that the tradeoff to be made is between protecting the greatest number of coral habitats possible, while preserving fishing opportunities. In terms of developing boundaries for coral zones, enforceability issues will need to be considered. Enforcement advice thus far has been informal, and rather general, but from their perspective, straight line boundaries that follow lines of latitude and longitude are the easiest. However, given the shape of the shelf-slope boundary and the incision of canyons into that boundary at irregular intervals, designing a management area boundary that effectively balances coral protection and fisheries considerations while meeting ideal enforcement criteria would be extremely difficult.

Committee discussion

In response to a Committee member's question, the Chair stated that the idea was not to select preferred options at this point, but to refine alternatives for further PDT analysis and initial council consideration at the April meeting. A Committee member concluded that while the PDT has done substantial work on this issue, there is much work remaining to determine the practicability of various options. The PDT chair agreed, and stated that analyses currently being developed to support the EBM process can be modified to address questions about the overlap between fisheries in coral zones. In particular, this includes a review of recent VMS data in the region. Another Committee member asked whether the intent was to protect all corals, or a representative sample. He noted that most of the species described in document 1 have minimum known depth distributions of around 300 meters or greater, extending into very deep waters. Thus, it seemed to him that a coral zone starting at 300 m or deeper would provide substantial coral protection.

Motion 1 (Goethel, Stockwell) To analyze three options for broad areas: 300 m, 400 m, 500 m; with the options based on contours rather than straight lines. (6/0/1)

Committee discussion

The Committee discussed that 300 m is deeper than the majority of current fishing effort, and that depth contours should be used rather than straight lines because they provide a better opportunity for protecting both corals and current fishing activities. This is because straight lines will inevitably include fished areas in the coral zone, or exclude coral areas from the coral zone, and the magnitude of the problem will be worse for simpler boundaries (i.e. those with less line segments) because of the shape of the shelf. Another Committee member noted that it might be difficult to analyze the difference between the three options in terms of fishing impacts. This is because the 300, 400, and 500 m contours are so closely spaced. The maker of the motion responded that by providing a range of options for public comment, it will allow an opportunity for industry to come forward and make a case for how the different depth options would affect their operations. A question that will be useful to answer to get a sense for the magnitude of potential impacts on any given fishery is what proportion of overall fishing effort by fishery would be affected by a particular option. The Mid-Atlantic Council representative noted that MAFMC discussed this issue a few weeks ago, and that the South Atlantic has coral zones based on the 400 m contour. He also noted that they are doing in-filling and out-filling of their coral areas (coral HAPCs) at the present time, and that it would be ideal if the New England and Mid-Atlantic Councils could anticipate some of these future modifications now, to avoid the need to adjust depth-based boundaries shortly after the Amendment is completed.

Audience discussion

Gib Brogan (Oceana) commented that adding 200 m to the range of options would allow the Council to gather information about fishing between 200-300 m. He asked about the Committee's intention regarding restrictions for the area – was it being proposed as an exploratory fishing zone? He also noted that it makes sense to send the Committee's ideal boundaries (i.e. contours) to enforcement at this stage, and see what kind of comments they come back with. Brad Sewell (National Resources Defense Council) asked about hard corals shallower than 300 meters, and noted that a broad range of options might provide the most flexibility in terms of coordination with MAFMC. Ron Smolowitz (Fisheries Survival Fund)

stated that the analysis will still look at areas shallower than 300 m in terms of additional coral benefits. He suggested reviewing the EFH designations for these depths. Finally, he asked what happens to the HAPCs developed during Phase 1 of the Omnibus Amendment – these are similar to but different than the likely set of coral zone boundaries.

Staff will include a request for information about fishing effort by depth when the Amendment goes out for public comments.

Motion 2 (Goethel, Stockwell) To analyze four options: (1) prohibit use of bottom tending gear, (2) prohibit use of mobile bottom tending gear; (3) presuming prohibition options, to allow exploratory fishing in discrete areas. Also, (4) to allow restrictions and prohibitions to be implemented via framework. (6/0/1)

Committee discussion

The intent of the motion would be to prohibit some types of fishing, but allow for exploratory fishing, provided that certain criteria are met.

Audience discussion

Mr. Smolowitz asked whether the intention was to allow for development of a status quo plus option that would not restrict fishing but would require enhanced monitoring. The Committee responded that such an option was not the intent of the motion. He also noted that it can be very difficult to get research and exploratory fishing permits.

The PDT will define exploratory fishing requirements when developing these alternatives.

Motion 3 (Grout, deFur) To analyze the following options for discrete deep-sea coral zones: (1) PDT recommended C1/C2 canyons and slope areas (coral-data-based and suitable habitat inferred), (2) PDT recommended C2 canyons (suitable habitat inferred), (3) seamounts identified by PDT as discrete zones, (4) two GOM discrete areas recommended by PDT as discrete zones. Intent is that options could be selected individually or in combination. Boundaries of these areas will be developed based on criteria provided in a subsequent motion. (6/0/1)

Committee discussion

The Committee discussed that discrete options weren't really necessary if a broad zone is approved.

Motion 4 (Grout, deFur) For the PDT to develop straight-line boundaries of the canyon and seamount discrete deep-sea coral zones, with canyon zones based on the three degree slope contour, and seamount zones based on the bathymetry that defines the seamount. (3/2/2)

Committee discussion

The maker of the motion noted the intention was to use the same criteria for defining boundaries as the PDT did when evaluating habitat suitability of the areas.

Audience discussion

Gib Brogan noted that the seamounts are steeply sloping towards the center of the feature, but have wide shoulders that contain corals. Brad Sewell thought that more latitude might be needed regarding the landward boundary. Ron Smolowitz supported a broad area only.

Motion 5 (Grout, deFur) Task the PDT to develop discrete boundaries for Committee consideration in Jordan Basin, based on known coral observations and suitable substrate for corals. (6/0/1)

Committee discussion

The intention of the Committee is that these would be small, focused areas. The Committee discussed that this area is heavily fished.

Motion 6 (Grout, Gibson) Task the PDT to develop discrete boundaries for Committee consideration in the Mt Desert Rock area, based on known coral observations and suitable substrate for corals. (3/2/2)

Committee discussion

It was noted that this area is very close to state waters, and that there is substantial lobster fishing in the vicinity. The Council cannot regulate lobster gear. There is likely very little mobile gear or other non-lobster fishing in the area.

Motion 7 (deFur, Stockwell) To analyze four options for discrete zones: (1) prohibit use of bottom tending gear, (2) prohibit use of mobile bottom tending gear; (3) presuming prohibition options, to allow exploratory fishing in discrete areas. Also, (4) to allow restrictions and prohibitions to be implemented via framework. (6/0/1)

Committee discussion

The maker of the motion noted a desire to be consistent with options being developed for the broad zone, and another committee member noted that this will allow for comparable analyses across the different areas. Another Committee member suggested that in general, boundaries should be drawn in such a way as to not impinge on current fishing activities.

Management Options to Minimize the Adverse Effects of Fishing on EFH

Next, the Committee reviewed the various management options intended to minimize the adverse effects on fishing on EFH. Most of these options have been discussed at previous meetings. Some changes were suggested, as indicated in the motions below. The intention is to forward the options, as amended, to the Groundfish PDT and Committee as soon as possible. Documents for this part of the meeting included:

1. Adverse effects options decision document (Doc 2)

Motion 8 (Stockwell, Gibson) Move forward the PDT's recommendations for Closed Area II – keep or eliminate current area (4/0/0)

There was no Committee or audience discussion of this motion.

Motion 9 (Stockwell, Gibson) Adopt the PDT’s recommendations for Georges Shoal (options A-E). (6/0/0)

Options A-E are as follows:

- Georges Shoal Option A: Establish Western Georges Shoal habitat management area and restrict use of trawl gears to shortened ground cable lengths
- Georges Shoal Option B: Establish Western Georges Shoal habitat management area and close to all mobile bottom-tending gears
- Georges Shoal Option C: Establish Eastern Georges Shoal habitat management area and restrict use of trawl gears to shortened ground cable lengths
- Georges Shoal Option D: Establish Eastern Georges Shoal habitat management area and close to all mobile bottom-tending gears
- Georges Shoal Option E: Establish a large Georges Shoal habitat management area and restrict use of trawl gears to shortened ground cable lengths

Audience discussion

Drew Minkiewicz (Fisheries Survival Fund) stated concerns about closing the eastern portion of the Georges Shoal area to scallop gear under option D, above. Vito Giacalone (Northeast Seafood Coalition) stated that lots of Georges Bank winter flounder are harvested from these areas, and supported the ground cable restriction options (A, C, E) rather than the closure options (B, D). He thought that it would be useful if the analysis addressed the proportion of the overall winter flounder harvest that comes out of these areas.

Motion 10 (Stockwell, Grout) Adopt PDT’s recommendation for CAI (Options A, B, and C). (6/0/0)

Options A-C are as follows:

- CAI Option A: Maintain existing CAI habitat closed areas (status quo)
- CAI Option B: Maintain the existing CAI habitat closed areas as gear modification areas
- CAI Option C: Eliminate CAI habitat closed areas

There was no Committee or audience discussion of this motion.

Motion 11 (Stockwell, Goethel) Adopt PDT’s recommendation for NLCA (Options A and B). (6/0/0)

Options A-B are as follows:

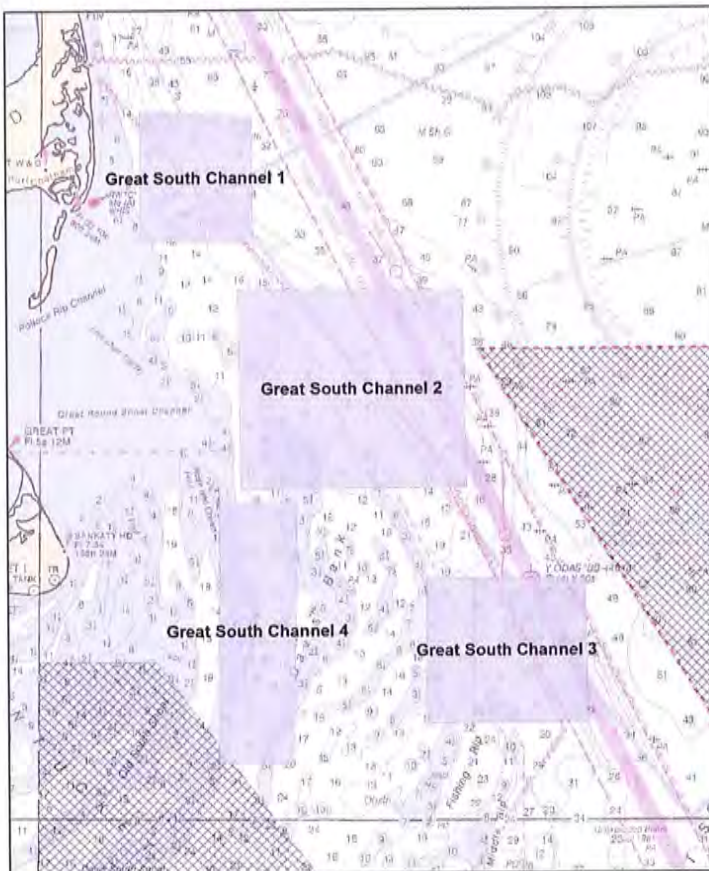
- NLCA Option A: Maintain existing Nantucket Lightship habitat closed area (status quo)
- NLCA Option B: Eliminate Nantucket Lightship habitat closed area

There was no Committee or audience discussion of this motion.

Motion 12 (Stockwell, Grout) Adopt PDT’s recommendation for GSC (Options A and B).
(6/0/0)

Options A-B are as follows. For clarity, the areas are numbered as shown on the chart.

- GSC Option A: Close to mobile bottom tending gear
- GSC Option B: Establish trawl gear ground cable modification requirements



Audience discussion

Mr. Minkiewicz noted the scallop industry’s concern with option A in Area 3. Mr. Smolowitz noted that this area is highly dynamic, and asked whether the habitat types that these management options are designed to protect are in fact self-protecting, because mobile gear fishermen avoid highly structured habitats due to concerns about damage to gear. He thought that an analysis of vessel monitoring system data would be helpful, particularly for scallops, to better understand where vessels fish within these areas.

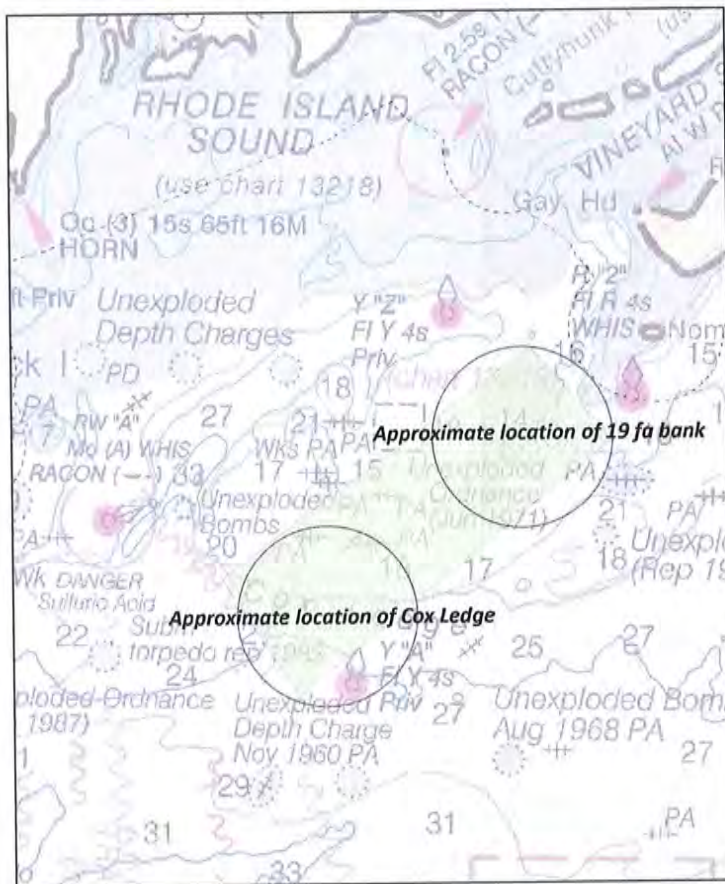
Committee discussion

A Committee member agreed that an analysis of the VMS data would be useful, and wondered about shifts in effort and catch per unit effort over time in the area.

Motion 13 (Stockwell, Goethel) Adopt the PDT’s recommendation that a habitat management area be established on Cox Ledge. Options to include closure to mobile bottom tending gear, and ground cable length trawl gear modification requirements. Two discrete areas based on SASI/substrate analysis will be developed before the next Committee meeting to replace the current recommended area. (6/0/0)

Committee discussion

The Committee discussed that the Cox Ledge area as currently identified actually contains two locations of interest – Cox Ledge and 19 Fathom Bank – and asked the PDT to develop boundaries for these areas. General locations of these features are shown on the figure below. The Committee discussed gear modification requirements generally, and asked the PDT to develop a list of modified gears that could be authorized for use in habitat areas by framework action.



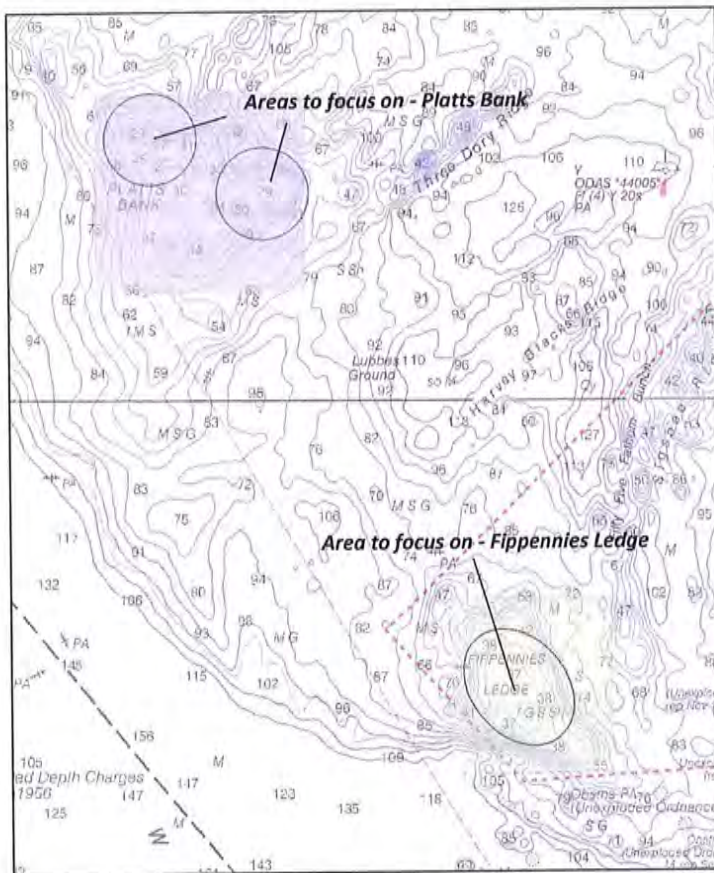
Motion 14 (Stockwell, Goethel) Adopt the PDT’s recommendations for Jeffreys Bank, Cashes Ledge, Platts Bank, and Fippennies Ledge as written in the adverse effects decision document, and that the PDT will develop discrete area boundaries for Fippennies Ledge and Platts Bank. (6/0/0)

Committee discussion

The Committee discussed that the areas on Fippennies Ledge and Platts Bank as currently drawn incorporate both shallower gravel habitats and deeper sand/mud habitats. Mobile gear fishing activities would be prohibited if these options were adopted, and this type of fishing occurs along the edge of the bank/ledge features in the deeper waters. Thus, the Committee asked the PDT to draft new area boundaries for Fippennies and Platts that avoid the deeper water fishing areas and focus on areas with gravel substrates.

Audience discussion

Mr. Giacalone suggested that boundaries following lines of latitude and longitude were preferable. He suggested that the updated areas could be designed to cover a certain portion of the bank/ledge feature, such as 50% or 75%.



Motion 15 (Goethel, Stockwell) For the WGOM, consider status quo (Option A), eliminating the area (Option B), removing NW corner (Option D). Also consider the Jeffreys Ledge area (Option C) and SWGOM Sub-Option E1 as mobile gear restricted areas. (6/0/0)

Committee discussion

Staff presented a range of new options developed by the PDT for the southwestern Gulf of Maine. These included the following:

- WGOM Option E: Modify the southern portion of the current WGOM area
 - Southern WGOM sub-option 1: within current WGOM habitat closure and multibeam sampling area
 - Southern WGOM sub-option 2: within current WGOM habitat closure and multibeam sampling area, plus additional areas on Tillies Bank
 - Southern WGOM sub-option 3: within current WGOM habitat closure and multibeam sampling area, plus additional area to the east extending to eastern boundary of current WGOM habitat closure
 - Southern WGOM sub-option 4: within current WGOM habitat closure and multibeam sampling area, plus additional area to the east extending to eastern boundary of current WGOM habitat closure, plus Wildcat Knoll
- WGOM option F: New Scantum option – extension of Jeffreys Ledge area to cover New Scantum
- WGOM option G: Gloucester Bank-Lower Stellwagen Bank option – additional area beginning at Gloucester Bank and extending to the southeast

The Committee discussed that the vulnerable habitat types on New Scantum, Gloucester Bank and surrounds, and Tillies Bank are not really fishable by mobile gears and questioned the need for habitat management areas in these locations. In the Gloucester Bank area in particular, there are some well-known tows (e.g. Olympia Tow) that run through the area, between the boulder ridge areas, but it seems that people avoid the boulder ridges when using mobile gears.

This prompted a discussion of whether these avoidance behaviors can be demonstrated using various types of fishery data – examination of study fleet data, trawl survey hangs data, and VMS data were suggested.

Audience discussion

Mr. Giacalone noted that fishermen regularly use chart plotters to map their trawl tracks, and have an incentive to keep these data because successful trawls tend to be repeated over and over again, while unsuccessful trawls or hangs are avoided during future trips. He suggested that the PDT review these data to understand the patterns of fishing over different habitat types. He noted his support for Option 1.

Mr. Brogan stated that he felt it was useful to set aside areas from mobile gear fishing as a precaution, even if most vessels cannot or would not fish in them without restrictions.

Craig MacDonald, Stellwagen Bank National Marine Sanctuary, agreed that Option 1 seemed suitable. He also noted that there has been substantial research efforts in the Sanctuary since the WGOM closure was implemented, and stated that the overlap area between the Sanctuary boundary and the WGOM closure (the ‘sliver’) has served as a reference area for those studies.

Dedicated Habitat Research Areas

The Committee chair stated that designation of research areas is an important part of the Amendment because it will allow for monitoring of the impacts and benefits of management changes. He referred to the list of research questions developed by the PDT (these can be found in the last section of the adverse effects decision document).

Mr. Smolowitz commented that in his opinion, the most important research questions related to fishery productivity and selective fishing, while questions about gear effects and natural disturbance were less important.

A Committee member stated that research areas should be: (1) very discrete, (2) have clear goals and objectives associated with each one, (3) be well mapped to provide a solid foundation for any work, (4) coordinated with the states, if possible. He gave the NH fish pen area as an example of this last point.

Mr. Giacalone noted that it will be important to consider what benefits may have accrued as a result of the existing closed areas. In many cases, long term area closures don't seem to have reversed negative trends in stock abundance, so in order to reverse the trends, it will be important to try and understand what factors are inhibiting recovery.

Mr. Minkiewicz felt that the research area process was being used as a backdoor mechanism for keeping currently closed areas off limits to fishing. His opinion is that there has been little work done in these areas. He was concerned that funding for new research will be very limited, and that area designation will not guarantee that new studies will be conducted. The Committee chair noted that research areas only need to be big enough to be enforceable, and to be useful for research purposes, but that his intention was that the areas be as discrete as possible.

The idea of sunset dates associated with DHRA designations was also raised.

Dr. MacDonald noted that SBNMS has developed a sanctuary ecological research area (SERA) proposal that addresses all of the PDT's habitat research questions. He acknowledged that the proposal had not been transmitted formally to the council, but noted that NOAA was looking forward to a full evaluation of the SERA proposal alongside other habitat areas in the Omnibus Amendment. He stated that NOAA's belief is that the best way to implement this type of proposal is via the Council process. He described past work that has occurred within the Sanctuary and surrounding areas, and noted that long term studies have been ongoing since 1998. These studies include periodic reassessment of 8 sites representing four distinct habitat types. The Committee discussed adding a review of the SERA proposal to the next Committee meeting, noting that it was appropriate for the Committee to discuss the issue and then decide if PDT work should be requested.

The meeting adjourned at approximately 4:30 p.m.



**New England Fishery Management Council
Habitat Plan Development Team Meeting Summary**

**March 7, 2012
Boston, MA**

PDT members: Michelle Bachman (chair), Tom Hoff, Jessica Coakley, Katie Richardson, Moira Kelly, David Stevenson, Chad Demarest, Geret DePiper, David Packer, Mark Lazzari, Peter Auster, Page Valentine

Committee members: David Preble (chair)

Others: Alexander Dorsk (NEFSC), additional audience members in person and via webinar

The Habitat PDT met on March 7, 2012 to discuss management options for the Omnibus EFH Amendment related to minimizing the adverse effects of fishing on EFH.

Two new members will be transitioning onto the PDT in the coming months. Jessica Coakley will be replacing Tom Hoff as the MAFMC representative, as Dr. Hoff is retiring this spring. Geret DePiper will be replacing Chad Demarest as the NEFSC economist later this year.

Coral alternatives

The Habitat Committee reviewed the PDT's recommendations about deep-sea coral areas at their meeting on 2/23/12, and developed a range of alternatives as follows:

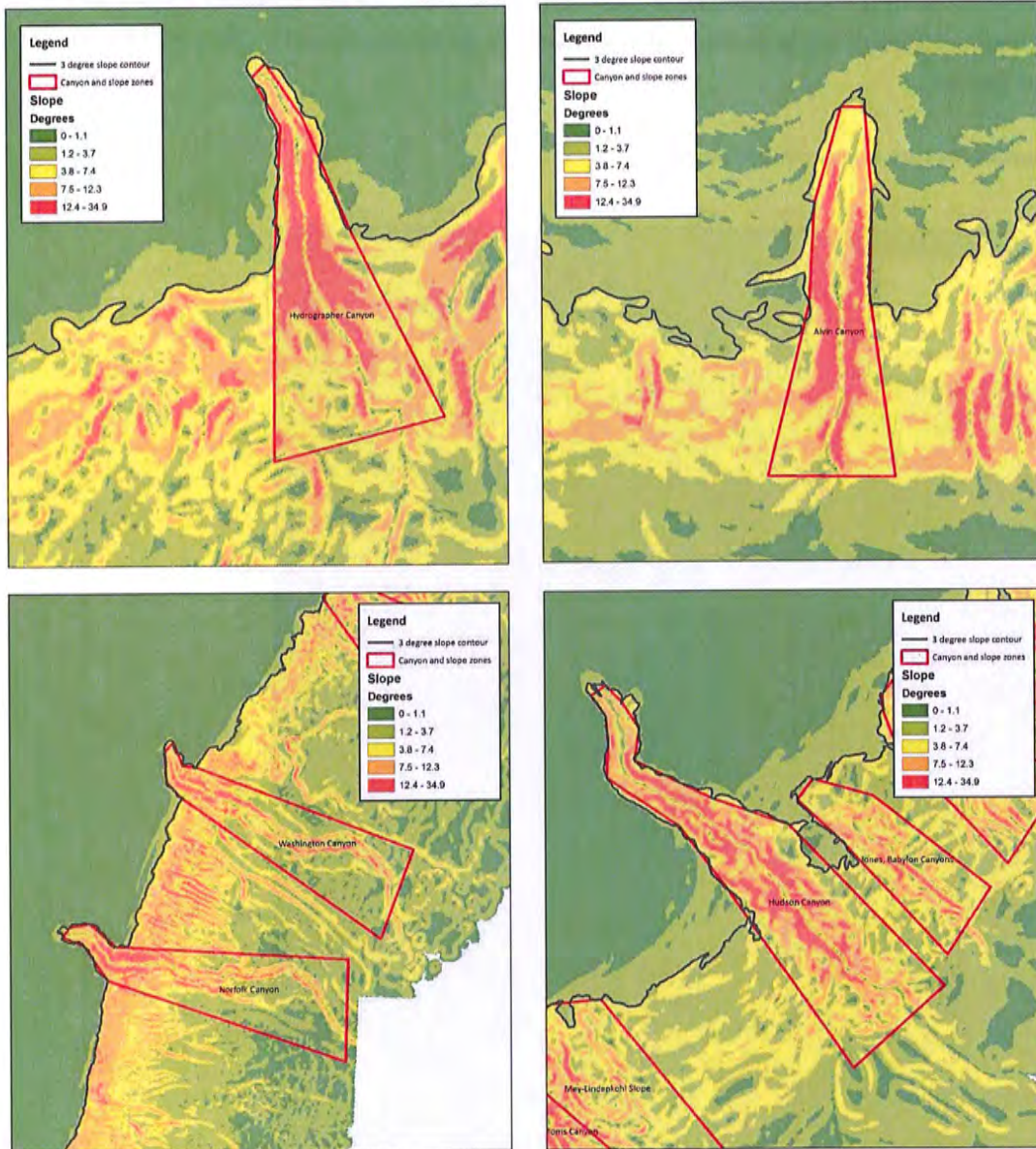
- Broad coral zones from the US-CAN EEZ boundary to the VA-NC border, extending from the 300, 400, or 500 m contour to the EEZ.
- Discrete coral zones including the following options:
 - Canyon and slope areas based on presence of corals and suitable habitats, with landward boundaries based on the 3 degree slope contour
 - Canyon areas based on inferred presence of suitable coral habitats, with landward boundaries based on the 3 degree slope contour
 - Seamount areas based on presence of corals and suitable habitat, or based on inferred presence of suitable coral habitats, with boundaries based on the bathymetry of the seamount feature
 - Gulf of Maine coral zones based on presence of corals and suitable habitats, with boundaries based on coral presence data and presence of suitable habitat

- Management options for all zones include:
 - Closure to mobile bottom-tending gear
 - Closure to bottom-tending gear
 - Provisions to exempt certain fishing activities from restrictions within the zones
 - Changes to management measures can be implemented via framework

PDT members recommended that coral documents emphasize the following: (1) deep-sea corals occur deeper than 50 m, (2) areas and associated management measures are not designed to protect sea pens, (3) canyon/slope maps and table should be arranged north-south throughout the document, (4) a summary table should be included that lists the number of areas evaluated vs. the number of areas recommended, by area type. The table listing the coral species of particular conservation interest will be updated. Also, the decision document will be updated to make it clear that the management options apply to all the different types of coral zones, and that the broad and discrete zones can be used separately, or combined.

The PDT discussed the seaward boundary for the discrete canyon and slope zones, and concluded that the boundary should be drawn separately for each area, and designed to encompass the areas with the largest slope values. To accomplish this task, the slope raster file in degrees was plotted in ArcMap using five discrete classes, with the breaks between classes determined using the natural breaks (Jenks) method. Discrete areas were drawn with the landward boundary based on the 3 degree slope contour, and the seaward boundary drawn to encompass the areas covered by the highest slope category. Some examples are shown on the following page for Hydrographer, Alvin, Hudson, and Norfolk/Washington Canyon areas. The maximum slope category groups areas with slopes ranging from 12-35 degrees. Throughout the region, these steep slope values are only found along the continental slope and in the canyons.

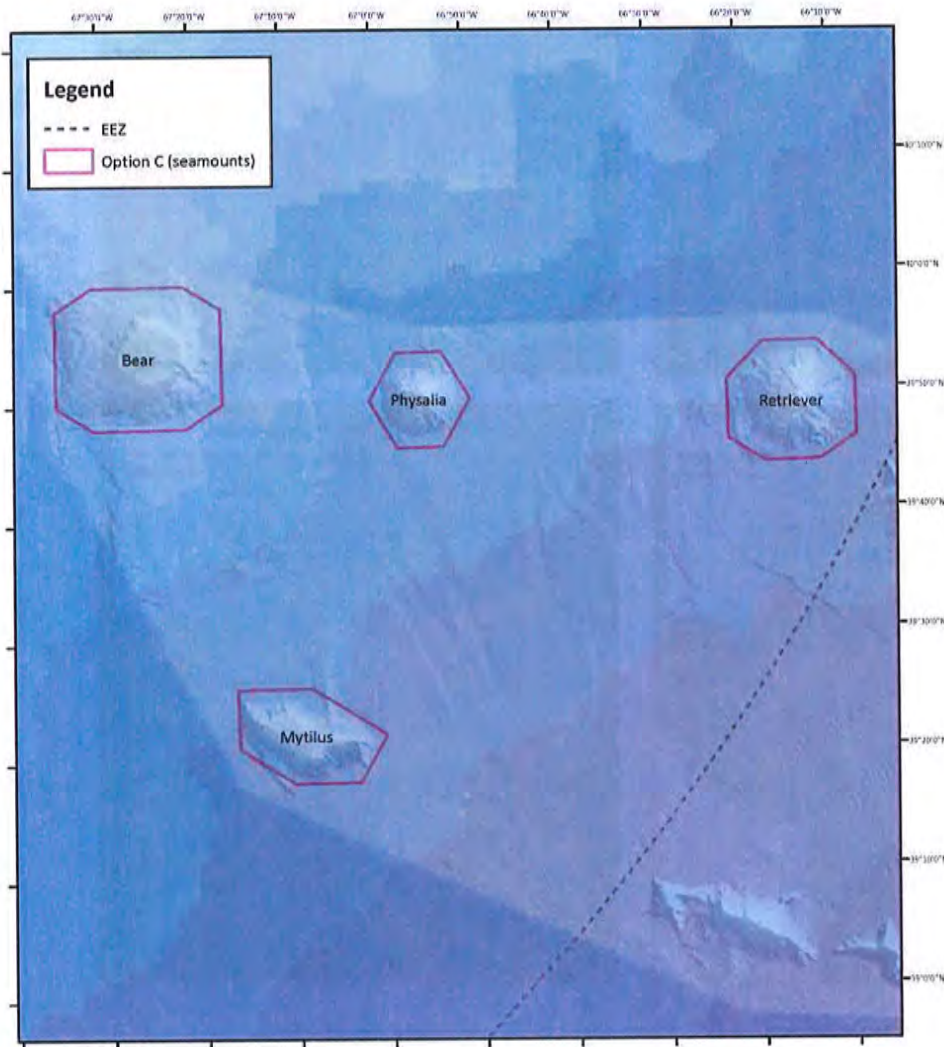
Figure 1 - Using slope values to define boundaries of canyon deep-sea coral protection zones



The PDT also discussed boundaries for seamount zones, which the Committee requested be identified based on the bathymetry of the seamount features. The best bathymetry data set to use for this purpose is the one housed at USGS, which was used to draw the boundaries shown below. These data were collected with a multibeam echosounder. On the figure, a hillshade layer is overlaid on the figure to show the shapes of the seamounts, and the surrounding coarse resolution bathymetry is ETOPO1 data.

It was straightforward to differentiate the seamount feature from the surrounding, flat abyssal plain for the purpose of drawing a boundary for each area. Also, a PDT member mentioned studies that characterize discrete ecological communities on the seamounts. This will be investigated further.

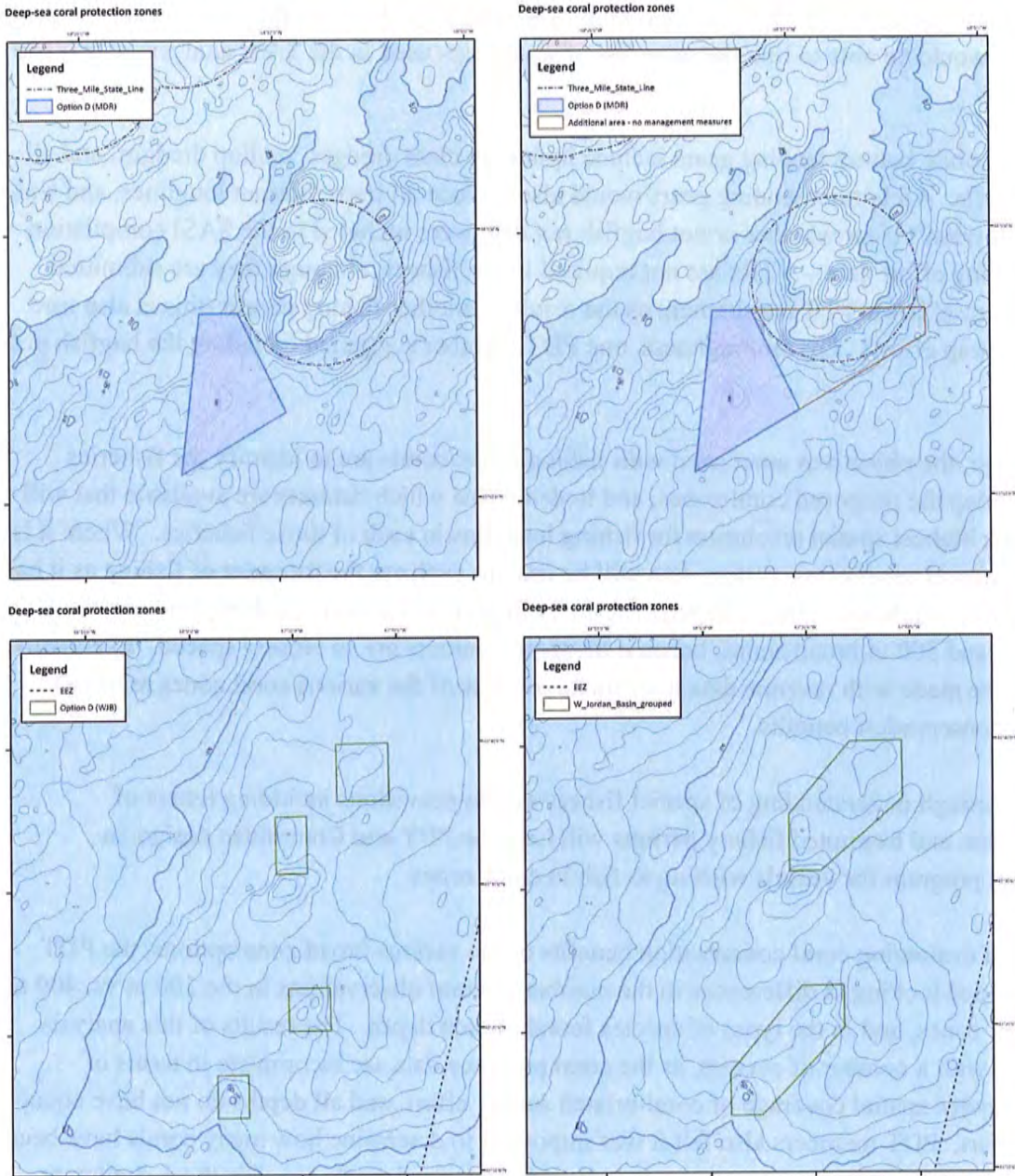
Figure 2 - Seamount deep-sea coral protection zones



The Committee requested that discrete (i.e. small) areas be identified for the Gulf of Maine coral zones around Mt Desert Rock and in western Jordan Basin. The PDT discussed that it would be useful to identify two areas around Mt Desert Rock – one that encompasses the entire area likely to contain suitable coral habitat (top right panel), and another that is outside state waters and would be recommended for management actions (top left panel). In western Jordan Basin, the PDT identified three areas where corals and hard substrates have been observed during ROV dives, and a fourth area that appears to be bathymetrically similar (bottom left panel). Another

option would be to connect the pairs of areas into two larger areas, as shown below (bottom right panel).

Figure 3 – Gulf of Maine deep-sea coral protection zones



Finally, the PDT discussed analysis of these zones, both in terms of fishing impacts and coral conservation benefits.

In terms of looking at fishing effort, there are a few avenues to pursue:

- Corrected VTR data for the deep-sea red crab trap fishery (Council and NERO staff are currently working on this issue)
- Squid data – in SASI this data layer was based on a trip landing more than 50% squid, gear code fish trawl. It wasn't based on a mesh size as there are issues with this. Ideally, we would be able to link the same list of squid trips used in the SASI analysis with VMS data.

Note that mobile bottom tending gears include hydraulic clam dredges, scallop dredges, and all bottom trawls. All bottom tending gears would also include all traps, bottom longlines, and sink gillnets. It wasn't clear whether or not hagfish pot data were included in the SASI compilation of trap fishing effort data – VTRs are not required in the fishery, although they are submitted when the vessel has a VTR requirement as the result of another fishing permit (this is also true for lobster trap effort). For thoroughness, one PDT member suggested including the hagfish pot data.

At this stage, the objectives associated with fishing effort/corals are to identify the fisheries which overlap the proposed coral zones, and to determine which datasets are available that will provide the highest spatial resolution for fishing locations in each of those fisheries. Where it is available, vessel monitoring system data will be used to evaluate the footprint of fishing as it has higher spatial resolution. This will be particularly important for distinguishing between the 300 m, 400 m, and 500 m broad zones, because the three contours are so closely spaced. Eventually, links will be made with revenue data to estimate impacts of the various coral zones relative to potential conservation benefits.

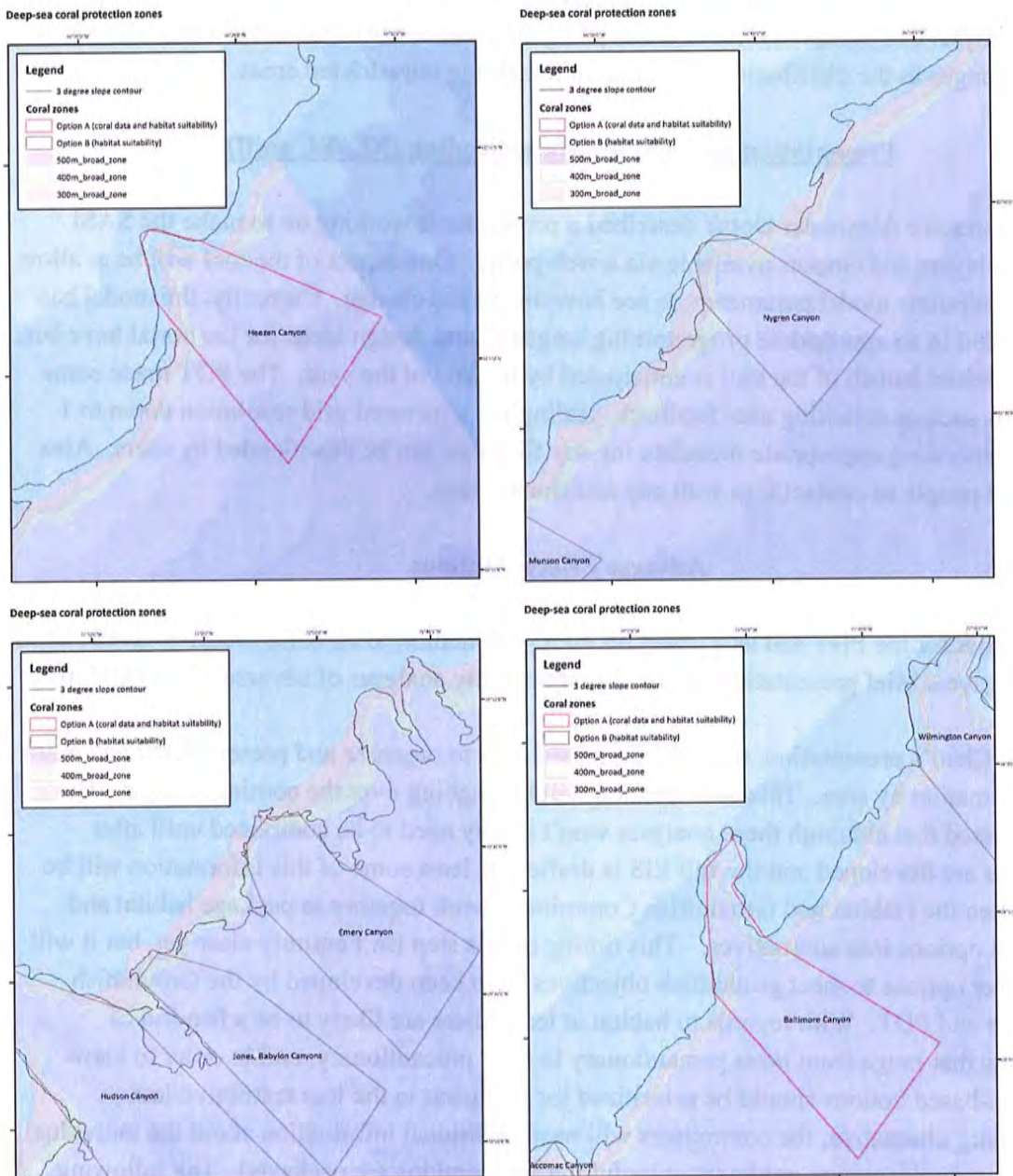
Also, a thorough understanding of special fishery access provisions including letters of authorization and exempted fishery permits will help the PDT and Committee design an exemption program for vessels wishing to fish in coral zones.

In terms of evaluating coral conservation benefits of the various broad zone options, the PDT recommended looking at differences in the number of coral observations in the 300 m vs. 400 m. vs. 500 m. zones, and in the types of species found at each depth. The results of this analysis will come with a number of caveats, as the coral presence data are incomplete in terms of comprehensive spatial coverage of coral-related survey effort, and all depths do not have equal survey effort. PDT members also felt it was important to determine how many corals have been observed shallower than 300 m, and to describe what types of corals occur in these shallower depths. Staff will work on this and report back to the PDT.

The PDT discussed that for relatively shallow waters, there will be greater conservation benefits from discrete zones based on a 3 degree slope contour as compared to any of the three broad zones options. This is because the discrete zones extend into shallower depths, generally

speaking. In many areas, the 3 degree slope contour corresponds to a depth of approximately 200 m. The figures below show the difference between the 3 degree slope contour and discrete zones as compared to the areas covered by the broad zone options. Of course, the broad zones would cover an array of smaller canyons and slope areas not encompassed by the discrete zones.

Figure 4 - Comparison between boundaries of selected discrete coral zones and adjacent broad zone boundaries



PDT members asked whether the Committee's intent was to implement broad and discrete zones together, or if their intent was to choose one management approach. Another question was whether the Committee indicated whether their intention was to implement all Option A (or Option B, or Option C) areas together, or if the intention was that individual sub-areas (i.e. individual canyons and seamounts) could be implemented separately in an a la carte fashion. Staff will follow up on these issues at the next Committee meeting on April 6. Analysis will be easier if options were implemented in groups, partly because it would be less cumbersome to conduct analysis and present the results, and partly because restrictions in one area could likely result in changes in the distribution of fishing in remaining unrestricted areas.

Presentation on SASI web-based coding (NEFSC staff)

NEFSC contractor Alexander Dorsk described a project he is working on to make the SASI model data layers and outputs available via a web portal. One aspect of the tool will be to allow users to manipulate model parameters to see how the results change. Currently, the model has been re-coded in an appropriate programming language and design ideas for the portal have been explored. Initial launch of the tool is anticipated by the end of the year. The PDT made some suggestions such as soliciting user feedback, scaling the structured grid resolution down to 1 km², and generating appropriate metadata for any files that can be downloaded by users. Alex encouraged people to contact him with any additional ideas.

Adverse Effects Options

As a refresher for the PDT and as a warm up for a presentation to an ICES working group, Chad Demarest gave a brief presentation on SASI practicability analyses of adverse effects options.

Related to Chad's presentation, the PDT discussed how to organize and present SASI and extra-SASI information by area. This conversation will be ongoing over the coming months. The PDT discussed that although these analyses won't really need to be completed until after alternatives are developed and the full EIS is drafted, at least some of this information will be helpful when the Habitat and Groundfish Committees work together to package habitat and groundfish options into alternatives. This timing of this step isn't entirely clear yet, but it will happen after options to meet groundfish objectives have been developed by the Groundfish Committee and PDT. With regards to habitat at least, there are likely to be a handful of alternatives that range from most precautionary to least precautionary, and in order to know which area-based options should be prioritized for inclusion in the less restrictive/less precautionary alternative, the committees will need additional information about the individual areas. Other analyses may not be meaningful until the options are packaged. The following metrics/issues were discussed:

- Measure of uncertainty – currently three model runs – base case, lower bound, higher bound – used to produce quasi-confidence intervals
- Spatial data support metric, which has an unstructured cell size element and a grain sizes detectable element, and will important to include alongside any quantitative results. An audience member suggested comparing local data support values to the global average to make them easier to interpret.
- The Committee has discussed the idea of developing regional alternatives – i.e. packages for the Gulf of Maine vs. Georges Bank. The PDT didn't spend much time on this issue, but discussed that while the analysis is doable, there will be pros and cons, especially if management changes in one region influence fishing behavior in the other region.
- Need to consider non-SASI information on an area-by-area basis. One element of this will be to consider how the ten habitat types coded into the SASI model, and the features associated with those habitat types, compare to what we know about the habitats found in specific locations.
- Also, we will need to make sure that we can turn any quantitative estimates into something that can be used for decision making – i.e., what differences in model outputs are meaningful in terms of discriminating between alternatives. Given local variation in habitats as compared to the generic modeled habitat types, and variation in data support values across the domain, it may be more useful to interpret and categorize the raw outputs.

The PDT also discussed a GIS analysis to explore the overlap between the area designated as EFH, proposed management areas, and vulnerable habitats. Staff prepared an example analysis for two species, Atlantic cod and yellowtail flounder. EFH for adults and juveniles was considered separately, and 'vulnerable' was defined as the grid cells with trawl gear Z_{∞} values greater than 0.5 standard deviations from the mean value. The results showed: (1) the total area of the species/lifestage EFH (km²), (2) the area that overlaps with the high Z_{∞} cells (km² and percent of EFH area), and (3) the area that overlaps with the high Z_{∞} cells and the proposed management areas (km² and percent of EFH area). Staff asked if this type of analysis was useful, and if so, whether it should be done for all species, or just for species that have some association with vulnerable habitat types (i.e. cobble and boulder habitat types). The following points were raised:

- One PDT member suggested focusing on the high end of the distribution for each species (perhaps the top 25%) to make the results more meaningful. The PDT discussed this in January (maps with different percentiles of the distribution were prepared) and felt at that time that it was better to use the entire EFH designation footprint.
- How does protecting large amount of habitat compare to protecting a small amount of the most essential habitats? Do we know which habitats are most essential?
- Are EFH designations best used for non-fishing impacts determinations? What is the overlap between EFH and proposed management areas? Just because there is spatial overlap, there is not necessarily adverse effect occurring.
- What are the stocks of fish that have the highest habitat affinity? Do they occur in proposed management areas?

- If you implement an area intended to encompass particular habitat types, and then implement measures to minimize adverse effects, what species will be best protected?

While there was no clear way forward by the conclusion of the discussion, the group seemed to be leaning towards a more qualitative analysis that does the following things:

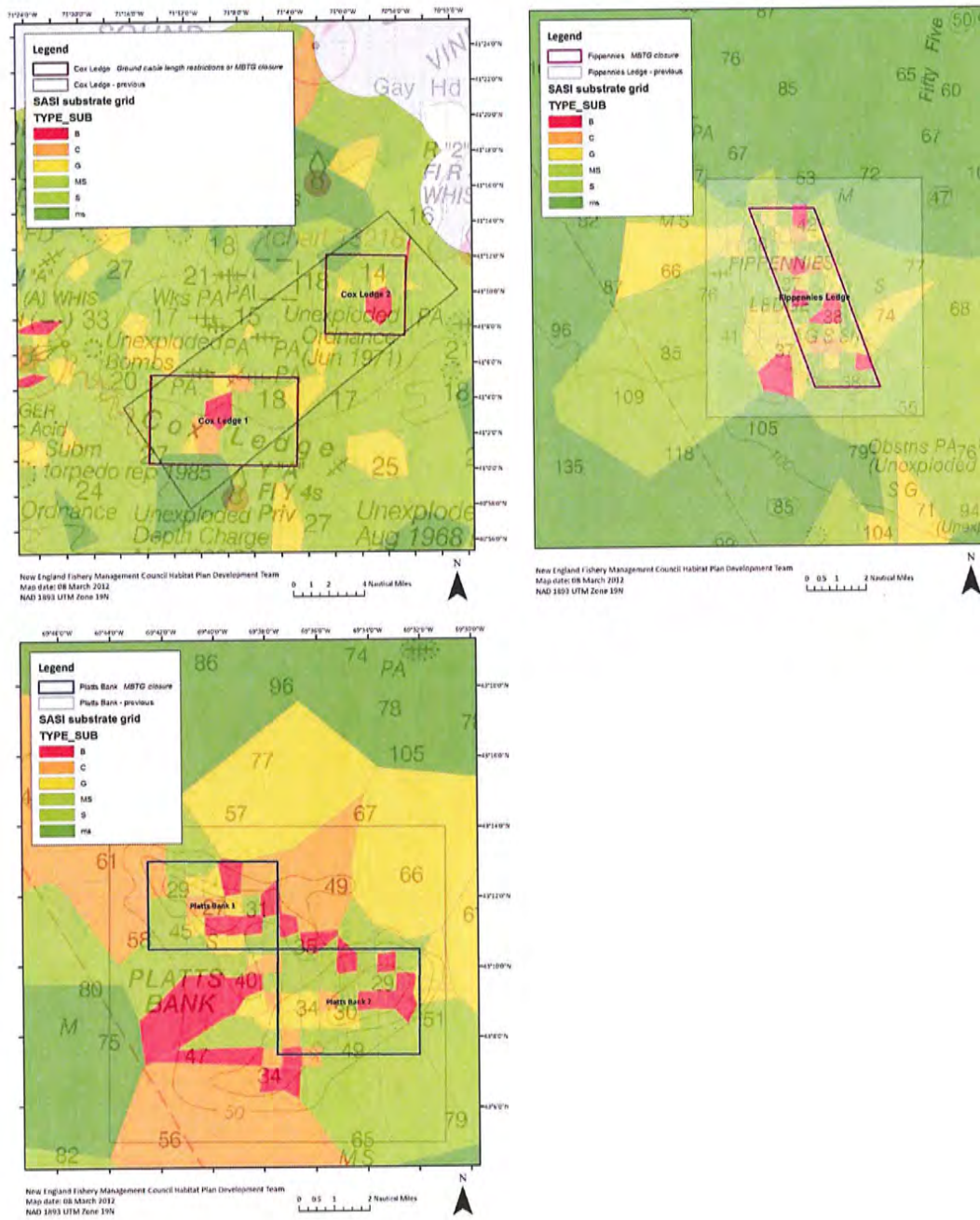
1. Identify the species that have known associations with vulnerable habitat types
2. Identify the overlap between vulnerable habitat types and proposed management areas
3. Determine which species (of those listed in step 1) occur in each proposed management area. The end goal is to figure out which species will potentially benefit from a reduction in adverse effects in each management area (or group of management areas).

At their meeting on 2/23 the Committee requested that the boundaries of some of the adverse effects management areas be refined as follows:

- Cox Ledge – make two areas focused on Cox Ledge and 19 Fathom Bank
- Fippennies Ledge – make the area smaller to focus on the top of the ledge
- Platts Bank – make two areas focused on the shallowest portions of the bank

The PDT reviewed preliminary modifications and developed the following areas consistent with the Committee's request:

Figure 5 - Updated boundaries for Cox Ledge, Fippennies Ledge, and Platts Bank habitat areas



The meeting adjourned at approximately 5 pm.